

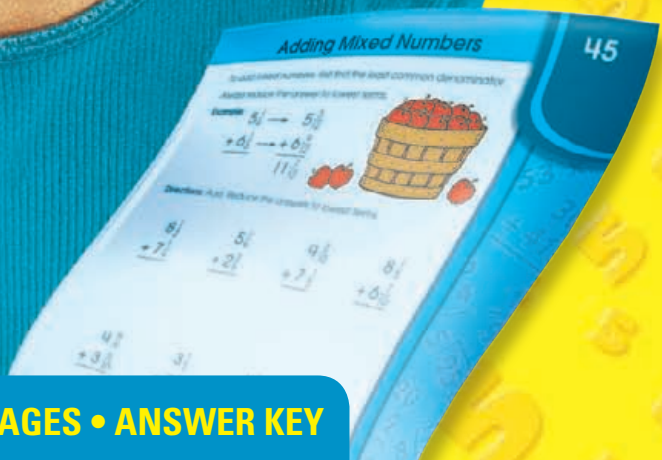
Math

GRADE
5



SKILLS

- Place Value
- Addition & Subtraction
- Regrouping
- Rounding & Estimating
- Prime Numbers
- Multiples & Factors
- Multiplication & Division
- Fractions & Decimals
- Geometry
- Perimeter & Area
- Volume
- Measurement
- Graphing
- Ratio & Percent
- Probability



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Place Value

The place value of a digit or numeral is shown by where it is in the number. In the number 1,234, 1 has the place value of thousands, 2 is hundreds, 3 is tens, and 4 is ones.

Example: 1,250,000,000

Read: One billion, two hundred fifty million

Write: 1,250,000,000

Billions			Millions			Thousands			Ones		
h	t	o	h	t	o	h	t	o	h	t	o
		1,	2	5	0,	0	0	0,	0	0	0

Directions: Read the words. Then, write the numbers.

twenty million, three hundred four thousand _____

five thousand, four hundred twenty-three _____

one hundred fifty billion, eight million,
one thousand, five hundred _____

sixty billion, seven hundred million,
one hundred thousand, three hundred twelve _____

six hundred ninety-nine million, four thousand,
nine hundred forty-two _____

Here's a game to play with a partner.

Write a 10-digit number using each digit, 0 to 9, only once. Do not show the number to your partner. Give clues like: "There is a five in the hundreds place." The clues can be given in any order. See if your partner can write the same number you have written.



Place Value

Directions: Draw a line to connect each number to its correct written form.

- | | |
|-------------------|--|
| 1. 791,000 | Seventeen million, five hundred thousand |
| 2. 17,500,000 | Seven hundred ninety-one thousand |
| 3. 3,500,000 | Seventy thousand, nine hundred ten |
| 4. 70,910 | Three million, five hundred thousand |
| 5. 35,500,000 | Seventeen billion, five hundred thousand |
| 6. 17,000,500,000 | Thirty-five million, five hundred thousand |

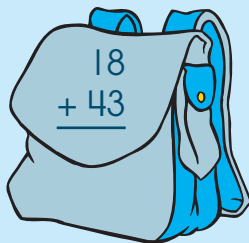
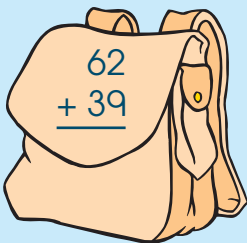
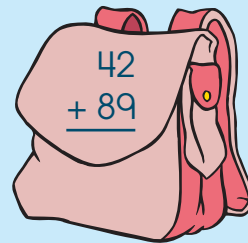
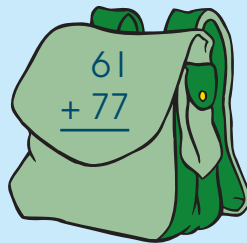
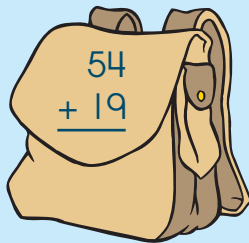
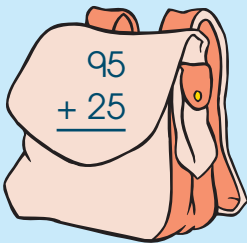
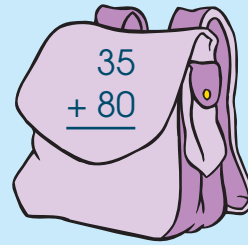
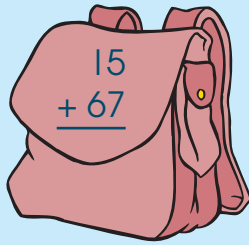
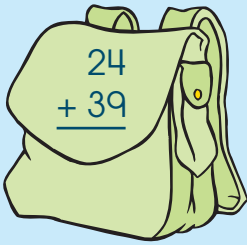
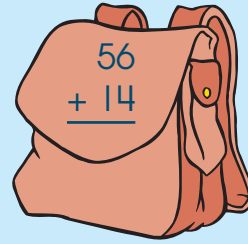
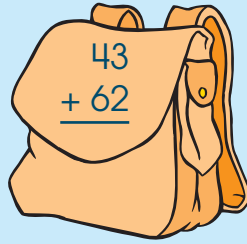
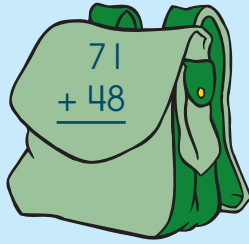
Directions: Look carefully at this number: 2,071,463,548. Write the numeral for each of the following places.

- _____ ten thousands
- _____ millions
- _____ hundreds
- _____ billions
- _____ hundred thousands
- _____ ten millions
- _____ one thousands
- _____ hundred millions

Addition

Addition is “putting together” two or more numbers to find the sum.

Directions: Add. Fill the backpacks with the right answers.



Addition

Teachers of an Earth Science class planned to take 50 students on an overnight hiking and camping experience. After planning the menu, they went to the grocery store for supplies.



<u>Breakfast</u>	<u>Lunch</u>	<u>Dinner</u>	<u>Snacks</u>
bacon	hot dogs/buns	pasta	crackers
eggs	apples	sauce	marshmallows
bread	chips	garlic bread	chocolate bars
cereal	juice	salad	cocoa mix
juice	granola bars	cookies	
\$34.50	\$ 52.15	\$ 47.25	\$ 23.40

Directions: Answer the questions. Write the total amount spent on food for the trip.

What information do you need to answer the question? _____

What is the total? _____

Directions: Add.

$$\begin{array}{r} 462 \\ + 574 \\ \hline \end{array}$$

$$\begin{array}{r} 918 \\ + 359 \\ \hline \end{array}$$

$$\begin{array}{r} 527 \\ + 582 \\ \hline \end{array}$$

$$\begin{array}{r} 386 \\ + 745 \\ \hline \end{array}$$

$$\begin{array}{r} 295 \\ + 764 \\ \hline \end{array}$$

$$\begin{array}{r} 1,568 \\ + 2,341 \\ \hline \end{array}$$

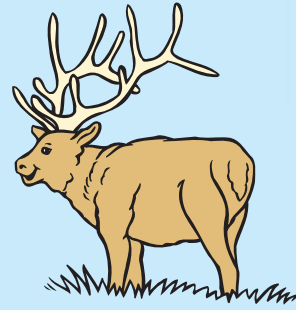
$$\begin{array}{r} 3,214 \\ + 2,896 \\ \hline \end{array}$$

$$\begin{array}{r} 5,147 \\ + 4,285 \\ \hline \end{array}$$

$$\begin{array}{r} 7,259 \\ + 2,451 \\ \hline \end{array}$$

$$\begin{array}{r} 9,317 \\ + 3,583 \\ \hline \end{array}$$

Directions: Add.



1. Tourists travel to national parks to see the many animals that live there. Park Rangers estimate 384 buffalo, 282 grizzly bears, and 426 deer are in the park. What is the total number of buffalo, bears, and deer estimated in the park?

2. Last August, 2,248 visitors drove motor homes into the campgrounds for overnight camping. 647 set up campsites with tents. How many campsites were there altogether in August?

3. During a three-week camping trip, Tom and his family hiked 42 miles, took a 126-mile-long canoeing trip, and drove their car 853 miles. How many miles did they travel in all?

4. Old Faithful is a geyser which spouts water high into the air. 10,000 gallons of water burst into the air regularly. Two other geysers spout 2,400 gallons of water during each eruption. What is the amount of water thrust into the air during one cycle?

5. Yellowstone National Park covers approximately 2,221,772 acres of land. Close by, the Grand Tetons covers approximately 310,350 acres. How many acres of land are there in these two parks?

Addition

Directions: Circle the lily pads with the correct answers to show the frogs the correct path to follow to join their mother on the other side of the pond.

$$\begin{array}{r} 14,525 \\ + 11,607 \\ \hline 25,122 \end{array}$$

$$\begin{array}{r} 74 \\ + 37 \\ \hline 111 \end{array}$$

$$\begin{array}{r} 375 \\ + 425 \\ \hline 800 \end{array}$$

$$\begin{array}{r} 1,197 \\ + 423 \\ \hline 1,520 \end{array}$$

$$\begin{array}{r} 486 \\ + 583 \\ \hline 964 \end{array}$$

$$\begin{array}{r} 65,219 \\ + 25,098 \\ \hline 90,317 \end{array}$$

$$\begin{array}{r} 870 \\ + 230 \\ \hline 1,100 \end{array}$$

$$\begin{array}{r} 765 \\ + 245 \\ \hline 1,010 \end{array}$$

$$\begin{array}{r} 83,159 \\ + 12,432 \\ \hline 95,581 \end{array}$$

$$\begin{array}{r} 754 \\ + 347 \\ \hline 1,091 \end{array}$$

$$\begin{array}{r} 4,217 \\ + 12,982 \\ \hline 17,199 \end{array}$$

$$\begin{array}{r} 26,492 \\ + 35,218 \\ \hline 51,600 \end{array}$$

$$\begin{array}{r} 49,639 \\ + 7,421 \\ \hline 57,060 \end{array}$$

$$\begin{array}{r} 8,951 \\ + 1,649 \\ \hline 10,500 \end{array}$$

$$\begin{array}{r} 73,482 \\ + 23,435 \\ \hline 96,817 \end{array}$$

Addition

Bob the butcher is popular with the dogs in town. He was making a delivery this morning when he noticed he was being followed by two dogs. Bob tried to climb a ladder to escape from the dogs. Solve the following addition problems and shade in the answers on the ladder. If all the numbers are shaded when the problems have been solved, Bob made it up the ladder. Some answers may not be on the ladder.

$$\begin{array}{r} 1. \quad 986,145 \\ \quad 621,332 \\ + 200,008 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 1,873,402 \\ \quad 925,666 \\ + \quad 4,689 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 506,328 \\ \quad 886,510 \\ + 342,225 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \quad 43,015 \\ \quad 2,811,604 \\ + \quad 987,053 \\ \hline \end{array}$$

$$\begin{array}{r} 5. \quad 18,443 \\ \quad 300,604 \\ + 999,999 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 8,075 \\ \quad 14,608 \\ + 33,914 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 9,162 \\ \quad 7,804 \\ + 755,122 \\ \hline \end{array}$$

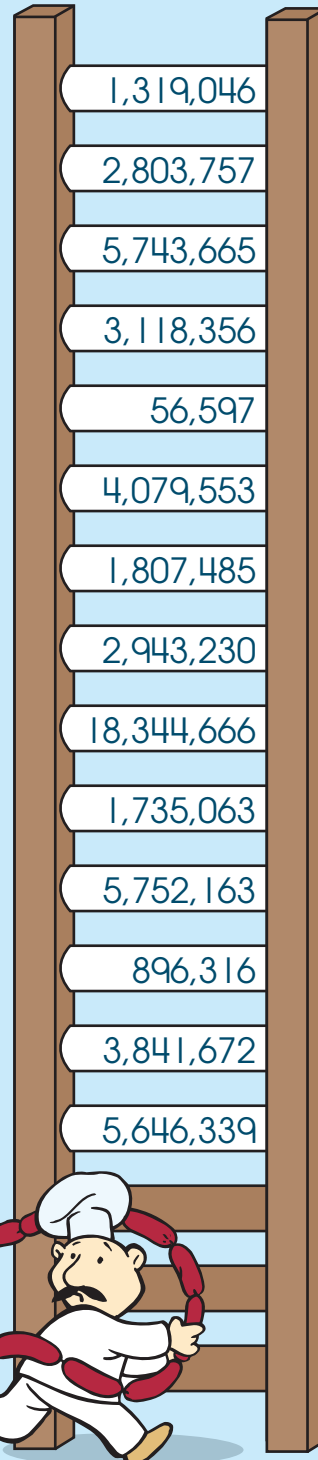
$$\begin{array}{r} 8. \quad 88,714 \\ \quad 213,653 \\ + 5,441,298 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 3,244,662 \\ \quad 1,986,114 \\ + \quad 521,387 \\ \hline \end{array}$$

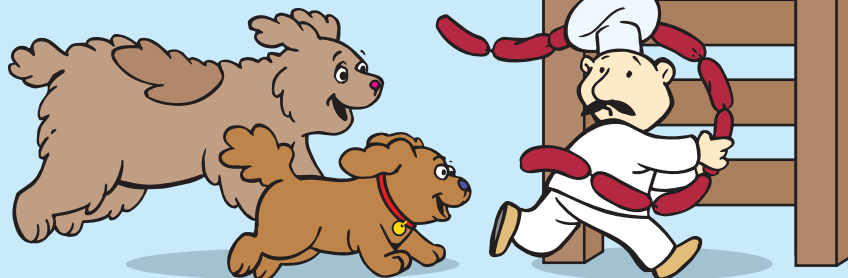
$$\begin{array}{r} 10. \quad 4,581 \\ \quad 22,983 \\ + 5,618,775 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 818,623 \\ \quad 926 \\ + 3,260,004 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 80,436 \\ \quad 9,159 \\ + 3,028,761 \\ \hline \end{array}$$



Does Bob make it?



Subtraction

Subtraction is “taking away” one number from another to find the difference between the two numbers.

Directions: Subtract.

$$\begin{array}{r} 76 \\ - 23 \\ \hline \end{array}$$

$$\begin{array}{r} 93 \\ - 14 \\ \hline \end{array}$$

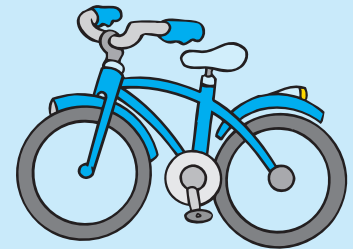
$$\begin{array}{r} 68 \\ - 25 \\ \hline \end{array}$$

$$\begin{array}{r} 49 \\ - 17 \\ \hline \end{array}$$

$$\begin{array}{r} 88 \\ - 39 \\ \hline \end{array}$$

$$\begin{array}{r} 54 \\ - 25 \\ \hline \end{array}$$

Brent saved \$75.00 of the money he earned delivering the local newspaper in his neighborhood. He wanted to buy a new bicycle that cost \$139.00. How much more would he need to save in order to buy the bike?



When Brent finally went to buy the bicycle, he saw a light and basket for the bike. He decided to buy them both. The light was \$5.95 and the basket was \$10.50. He gave the clerk a twenty dollar bill his grandmother had given him for his birthday. How much change did he get back?



Subtraction



When working with larger numbers, it is important to keep the numbers lined up according to place value.

Directions: Subtract.

$$\begin{array}{r} 398 \\ - 149 \\ \hline \end{array}$$

$$\begin{array}{r} 543 \\ - 287 \\ \hline \end{array}$$

$$\begin{array}{r} 491 \\ - 311 \\ \hline \end{array}$$

$$\begin{array}{r} 8,391 \\ - 5,492 \\ \hline \end{array}$$

$$\begin{array}{r} 63,852 \\ - 34,765 \\ \hline \end{array}$$

$$\begin{array}{r} 24,107 \\ - 19,350 \\ \hline \end{array}$$



Eagle Peak is the highest mountain peak at Yellowstone National Park. It is 11,353 feet high. The next highest point at the park is Mount Washburn. It is 10,243 feet tall. How much higher is Eagle Peak?

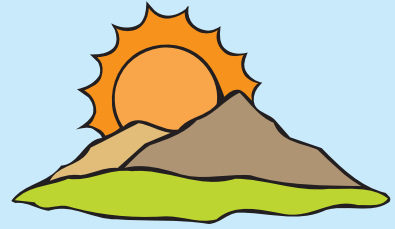
The highest mountain peak in North America is Mount McKinley, which stretches 20,320 feet toward the sky. Two other mountain ranges in North America have peaks at 10,302 feet and 8,194 feet. What is the greatest difference between the peaks?

Checking Subtraction

You can check your subtraction by using addition.

Example:

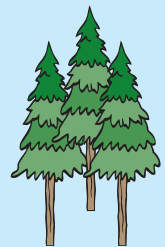
$$\begin{array}{r}
 34,436 \\
 - 12,264 \\
 \hline
 22,172
 \end{array}
 \quad \begin{array}{l}
 \text{Check:} \\
 \rightarrow \\
 \rightarrow \\
 \rightarrow
 \end{array}
 \begin{array}{r}
 22,172 \\
 + 12,264 \\
 \hline
 34,436
 \end{array}$$



Directions: Subtract. Then, check your answers by adding.

$ \begin{array}{r} 15,326 \\ - 11,532 \\ \hline \end{array} $	Check:	$ \begin{array}{r} 28,615 \\ - 25,329 \\ \hline \end{array} $	Check:
$ \begin{array}{r} 96,521 \\ - 47,378 \\ \hline \end{array} $	Check:	$ \begin{array}{r} 46,496 \\ - 35,877 \\ \hline \end{array} $	Check:
$ \begin{array}{r} 77,911 \\ - 63,783 \\ \hline \end{array} $	Check:	$ \begin{array}{r} 156,901 \\ - 112,732 \\ \hline \end{array} $	Check:
$ \begin{array}{r} 395,638 \\ - 187,569 \\ \hline \end{array} $	Check:	$ \begin{array}{r} 67,002 \\ - 53,195 \\ \hline \end{array} $	Check:
$ \begin{array}{r} 16,075 \\ - 15,896 \\ \hline \end{array} $	Check:	$ \begin{array}{r} 39,678 \\ - 19,769 \\ \hline \end{array} $	Check:

During the summer, 158,941 people visited Yellowstone National Park. During the fall, there were 52,397 visitors. How many more visitors went to the park during the summer than the fall?



Addition and Subtraction

Directions: Check the answers. Write **T** if the answer is true and **F** if it is false. The first one is done for you.

Example:
$$\begin{array}{r} 48,973 \\ - 35,856 \\ \hline 13,118 \end{array}$$
 Check:
$$\begin{array}{r} 35,856 \\ + 13,118 \\ \hline 48,974 \end{array}$$
 F

$$\begin{array}{r} 18,264 \\ + 17,893 \\ \hline 36,157 \end{array}$$
 Check: _____
$$\begin{array}{r} 458,342 \\ - 297,652 \\ \hline 160,680 \end{array}$$
 Check: _____

$$\begin{array}{r} 39,854 \\ + 52,713 \\ \hline 92,577 \end{array}$$
 Check: _____
$$\begin{array}{r} 631,928 \\ - 457,615 \\ \hline 174,313 \end{array}$$
 Check: _____

$$\begin{array}{r} 14,389 \\ + 93,587 \\ \hline 107,976 \end{array}$$
 Check: _____
$$\begin{array}{r} 554,974 \\ - 376,585 \\ \hline 178,389 \end{array}$$
 Check: _____

Directions: Read the story problem. Write the equation and check the answer.

A camper hikes 53,741 feet out into the wilderness. On his return trip he takes a shortcut, walking 36,752 feet back to his cabin. The shortcut saves him 16,998 feet of hiking. True or false?



Addition and Subtraction

Directions: Add or subtract to find the answers.

Eastland School hosted a field day. Students could sign up for a variety of events. 175 students signed up for individual races. 20 two-person teams competed in the mile relay, and 36 kids took part in the high jump. How many students participated in the activities?



Westmore School brought 42 students and 7 adults to the field day event. Northern School brought 84 students and 15 adults. There was a total of 300 students and 45 adults at the event. How many were from other schools?

The Booster Club sponsored a concession stand during the day. Last year, they made \$1,000 at the same event. This year, they hoped to earn at least \$1,250. They actually raised \$1,842. How much more did they make than they had anticipated?

The Booster Club decided to spend \$1,000 to purchase several items for the school with the money they had earned. Study the list of items suggested and decide which combination of items they could purchase.

- | | | |
|------------------|-------|-------|
| A. Swing set | \$425 | _____ |
| B. Sliding board | \$263 | _____ |
| C. Scoreboard | \$515 | _____ |
| D. Team uniforms | \$180 | _____ |

When adding many numbers together, be sure to keep them lined up according to their place value.

Directions: Add. Use a calculator to check your answers.

$$\begin{array}{r} 408,107 \\ 31,641 \\ 9,111 \\ 400 \\ + 295 \\ \hline \end{array}$$

$$\begin{array}{r} 75,310 \\ 89,632 \\ 1,542 \\ 736 \\ + 922 \\ \hline \end{array}$$

$$\begin{array}{r} 708,302 \\ 40,927 \\ 20,085 \\ 343 \\ + 589 \\ \hline \end{array}$$

$$\begin{array}{r} 6,700,241 \\ 9,334,300 \\ 3,017 \\ 4,322,119 \\ + 7,384 \\ \hline \end{array}$$

$$\begin{array}{r} 215,106 \\ 69,015 \\ 5,446 \\ 621 \\ + 306 \\ \hline \end{array}$$

$$\begin{array}{r} 3,892,442 \\ 318,712 \\ 76,698 \\ 7,361 \\ + 567 \\ \hline \end{array}$$

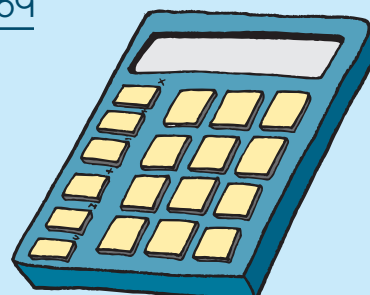
$$\begin{array}{r} 5,312,612 \\ 680,325 \\ 46,659 \\ 7,360 \\ + 812 \\ \hline \end{array}$$

$$\begin{array}{r} 8,700,370 \\ 804,304 \\ 17,009 \\ 7,919 \\ + 250 \\ \hline \end{array}$$

$$\begin{array}{r} 954,432 \\ 126,243 \\ 27,591 \\ 8,920 \\ + 27 \\ \hline \end{array}$$

$$\begin{array}{r} 6,935 \\ 12,897 \\ 69,473 \\ 43,190 \\ + 48,579 \\ \hline \end{array}$$

$$\begin{array}{r} 12,897 \\ 64,382 \\ 29,318 \\ 13,269 \\ + 4,769 \\ \hline \end{array}$$



Rounding

Rounding a number means to express it to the nearest ten, hundred, thousand, and so on. When rounding a number to the nearest ten, if the number has five or more ones, round up. Round down if the number has four or fewer ones.



Examples:

Round to the nearest **ten**: $84 \rightarrow \underline{80}$ $86 \rightarrow \underline{90}$

Round to the nearest **hundred**: $187 \rightarrow \underline{200}$ $120 \rightarrow \underline{100}$

Round to the nearest **thousand**: $981 \rightarrow \underline{1,000}$ $5,480 \rightarrow \underline{5,000}$

Directions: Round these numbers to the nearest **ten**.

$87 \rightarrow \underline{\quad}$ $53 \rightarrow \underline{\quad}$ $48 \rightarrow \underline{\quad}$ $32 \rightarrow \underline{\quad}$

Directions: Round these numbers to the nearest **hundred**.

$168 \rightarrow \underline{\quad}$ $243 \rightarrow \underline{\quad}$ $591 \rightarrow \underline{\quad}$ $743 \rightarrow \underline{\quad}$

Directions: Round these numbers to the nearest **thousand**.

$895 \rightarrow \underline{\quad}$ $3,492 \rightarrow \underline{\quad}$

$7,521 \rightarrow \underline{\quad}$ $14,904 \rightarrow \underline{\quad}$

City Populations	
City	Population
Cleveland	492,801
Seattle	520,947
Omaha	345,033
Kansas City	443,878
Atlanta	396,052
Austin	514,013

Directions: Use the city population chart to answer the questions.

Which cities have a population of about 500,000?

Which city has a population of about 350,000?

How many cities have a population of about 400,000?

Estimating

To **estimate** means to give an approximate rather than an exact answer. Rounding each number first makes it easy to estimate an answer.

Example:

$$\begin{array}{r} 93 \longrightarrow 90 \\ + 48 \longrightarrow + 50 \\ \hline 140 \end{array}$$

$$\begin{array}{r} 321 \longrightarrow 300 \\ + 597 \longrightarrow + 600 \\ \hline 900 \end{array}$$

$$\begin{array}{r} 1,859 \longrightarrow 2,000 \\ - 997 \longrightarrow - 1,000 \\ \hline 1,000 \end{array}$$

Directions: Estimate the sums and differences by rounding the numbers first.

$\begin{array}{r} 68 \longrightarrow \\ + 34 \longrightarrow \\ \hline \end{array}$	$\begin{array}{r} 12 \longrightarrow \\ + 98 \longrightarrow \\ \hline \end{array}$	$\begin{array}{r} 271 \longrightarrow \\ - 126 \longrightarrow \\ \hline \end{array}$
$\begin{array}{r} 1,532 \longrightarrow \\ - 998 \longrightarrow \\ \hline \end{array}$	$\begin{array}{r} 8,312 \longrightarrow \\ - 4,789 \longrightarrow \\ \hline \end{array}$	$\begin{array}{r} 6,341 \longrightarrow \\ + 9,286 \longrightarrow \\ \hline \end{array}$

Bonnie has \$50 to purchase tennis shoes, a tennis racquet, and tennis balls. Does she have enough money?



Rounding and Estimating

Rounding numbers and estimating answers is an easy way of finding the approximate answer without writing out the problem or using a calculator.

Directions: Circle the correct answer.

Round to the nearest **ten**:

$$73 \longrightarrow \begin{array}{c} 70 \\ 80 \end{array}$$

$$48 \longrightarrow \begin{array}{c} 40 \\ 50 \end{array}$$

$$65 \longrightarrow \begin{array}{c} 60 \\ 70 \end{array}$$

Round to the nearest **hundred**:

$$139 \longrightarrow \begin{array}{c} 100 \\ 200 \end{array}$$

$$782 \longrightarrow \begin{array}{c} 700 \\ 800 \end{array}$$

$$390 \longrightarrow \begin{array}{c} 300 \\ 400 \end{array}$$

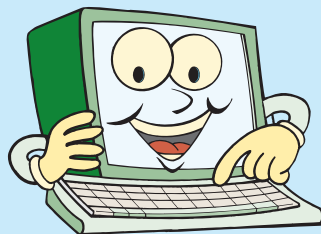
Round to the nearest **thousand**:

$$1,375 \longrightarrow \begin{array}{c} 1,000 \\ 2,000 \end{array}$$

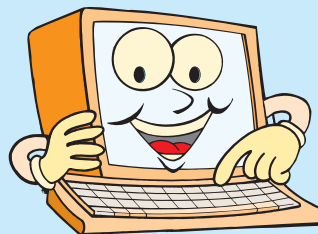
$$21,800 \longrightarrow \begin{array}{c} 21,000 \\ 22,000 \end{array}$$

$$36,240 \longrightarrow \begin{array}{c} 36,000 \\ 37,000 \end{array}$$

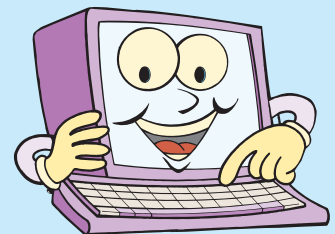
Sam wanted to buy a new computer. He knew he only had about \$1,200 to spend. Which of the following ones could he afford to buy?



\$1,165



\$1,279



\$1,249

If Sam spent \$39 on software for his new computer, \$265 for a printer, and \$38 for a cordless mouse, about how much money did he need?

Directions: Add.

1. $45 + 50 =$ _____

5. $72 + 28 =$ _____

2. $63 + 37 =$ _____

6. $56 + 16 =$ _____

3. $25 + 60 =$ _____

7. $90 + 43 =$ _____

4. $55 +$ _____ $= 110$

8. $63 +$ _____ $= 136$

Anne ordered these items for breakfast at her favorite restaurant:

scrambled eggs

toast

orange juice

bacon strips

How much did she spend? _____

Anne paid for her breakfast with a 10-dollar bill. How much change should she get back?

Specials	
Eggs	\$2.50
Bacon	\$2.15
Toast	\$1.20
Juice	\$1.25

Directions: Subtract.

9. $95 - 30 =$ _____

13. $49 - 10 =$ _____

10. $125 - 50 =$ _____

14. $78 - 30 =$ _____

11. $67 - 20 =$ _____

15. $150 - 65 =$ _____

12. $140 -$ _____ $= 60$

16. $185 -$ _____ $= 95$

Directions: Add.

$$\begin{array}{r} 256 \\ + 538 \\ \hline \end{array}$$

$$\begin{array}{r} 8,968 \\ + 3,481 \\ \hline \end{array}$$

$$\begin{array}{r} 28,493 \\ + 38,975 \\ \hline \end{array}$$

$$\begin{array}{r} 168,573 \\ + 257,899 \\ \hline \end{array}$$

Directions: Subtract.

$$\begin{array}{r} 189,453 \\ - 98,794 \\ \hline \end{array}$$

$$\begin{array}{r} 1,350,681 \\ - 467,792 \\ \hline \end{array}$$

$$\begin{array}{r} 856,721 \\ - 650,853 \\ \hline \end{array}$$

$$\begin{array}{r} 29,051 \\ - 15,160 \\ \hline \end{array}$$

Directions: Draw a line to the number that has:

five ten millions

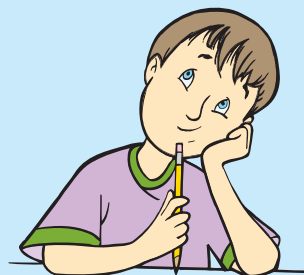
1,950,783

six hundreds

45,640

nine hundred thousands

1,453,682,073

**Directions:** Round to the nearest:

ten 83 → _____

77 → _____

hundred 4,848 → _____

8,501 → _____

thousand 2,920 → _____

179,642 → _____

million 1,891,403 → _____

3,499,999 → _____

Directions: Estimate the sums and differences by rounding.

$$\begin{array}{r} 582 \\ + 175 \end{array} \rightarrow$$

$$\begin{array}{r} 7,951 \\ - 1,241 \end{array} \rightarrow$$

$$\begin{array}{r} 6,891 \\ + 578 \end{array} \rightarrow$$

$$\begin{array}{r} 17,988 \\ - 5,749 \end{array} \rightarrow$$

Prime Numbers

A prime number cannot be divided evenly by any number. A prime number is always greater than 1.

Example:

3 is a prime number,
 $3 \div 1 = 3$ and $3 \div 3 = 1$

Any other divisor will result in a mixed number or fraction.

Example:

11 can only be divided by 1 and 11. It is a prime number.

Directions: Write the first 15 prime numbers.

Prime Numbers:

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

How many prime numbers are there between 0 and 100? _____



Prime Numbers

Directions: Circle the prime numbers.

71	3	82	20	43	69
128	97	23	111	75	51
13	44	137	68	171	83
61	21	77	101	34	16
2	39	92	17	52	29
19	156	63	99	27	147
121	25	88	12	87	55
57	7	139	91	9	37
67	183	5	59	11	95

Multiples

A **multiple** is the product of a specific number and any other number. When you multiply two numbers, the answer is called the **product**.

Example:

The multiples of 2 are 2 (2×1), 4 (2×2), 6, 8, 10, 12, and so on.

The **least common multiple** (LCM) of two or more numbers is the smallest number other than 0 that is a multiple of each number.

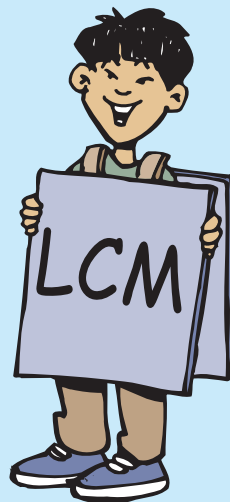
Example:

Multiples of 3 are 3, 6, 9, 12, 15, 18, 21, 24, etc.

Multiples of 6 are 6, 12, 18, 24, 30, 36, 42, etc.

The multiples that 3 and 6 have in common are 6, 12, 18, 24.

The LCM of 3 and 6 is 6.



Directions: Write the first nine multiples of 3, 4, and 6. Write the LCM.

3: _____

4: _____

6: _____

LCM = _____

Directions: Write the first nine multiples of 2 and 5. Write the LCM.

2: _____

5: _____

LCM = _____

Directions: Find the LCM for each pair of numbers.

7 and 3 _____ 4 and 6 _____ 6 and 9 _____

Directions: Fill in the missing numbers.

30 has multiples of 5 and _____, of 2 and _____, of 3 and _____.

Factors are the numbers multiplied together to give a product. The **greatest common factor** (GCF) is the largest number for a set of numbers that divides evenly into each number in the set.

Example:

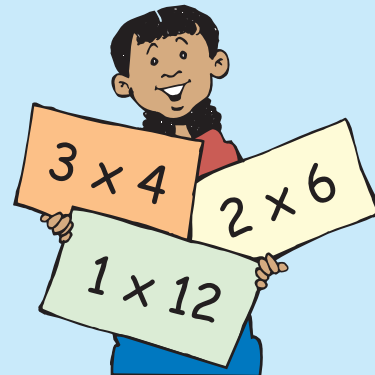
The factors of 12 are 3×4 , 2×6 ,
and 1×12 .

We can write the factors like this:
 $3, 4, 2, 6, 12, 1$.

The factors of 8 are $2, 4, 8, 1$.

The common factors of 12 and 8
are 2 and 4 and 1 .

The GCF of 12 and 8 is 4 .



Directions: Write the factors of each pair of numbers. Then, write the common factors and the GCF.

12: _____, _____, _____, _____, _____, _____

15: _____, _____, _____, _____

The common factors of 12 and 15 are _____, _____.

The GCF is _____.

20: _____, _____, _____, _____, _____, _____

10: _____, _____, _____, _____

The common factors of 10 and 20 are _____, _____, _____, _____.

The GCF is _____.

Directions: Write the GCF for the following pairs of numbers.

28 and 20 _____

42 and 12 _____

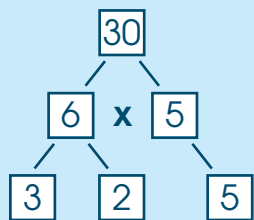
36 and 12 _____

20 and 5 _____

Factor Trees

A **factor tree** shows the prime factors of a number. A prime number, such as 7, has for its factors only itself and 1.

Example:

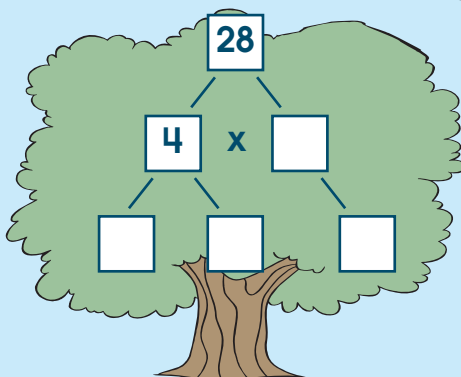
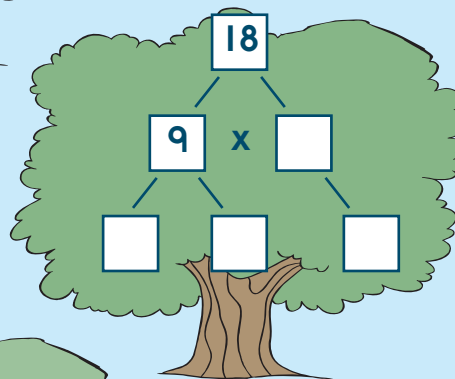
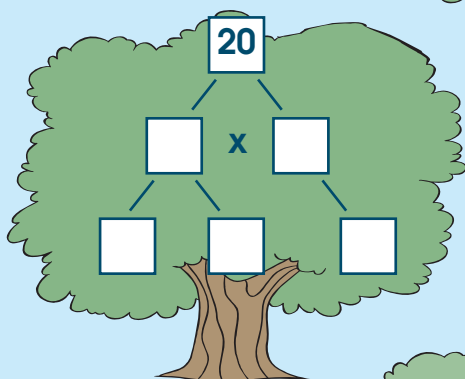
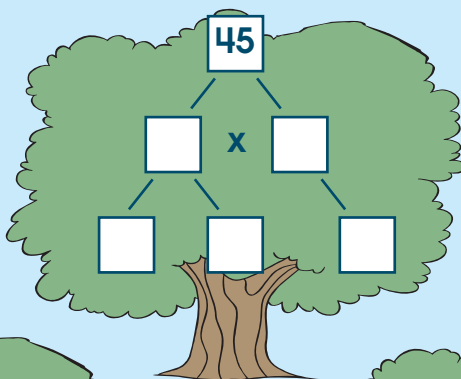
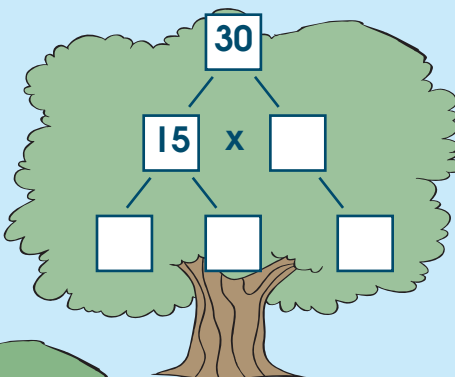
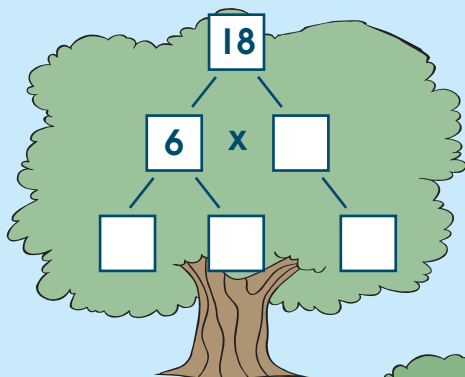


$$30 = 3 \times 2 \times 5.$$

3, 2, and 5 are prime numbers.

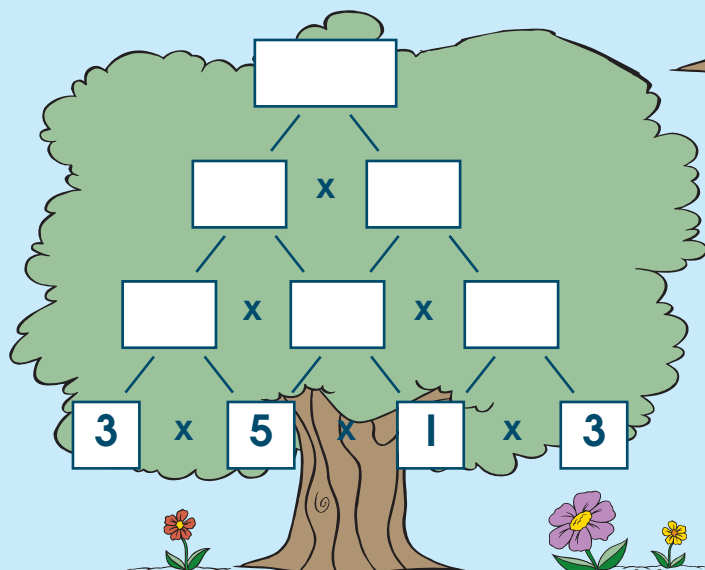
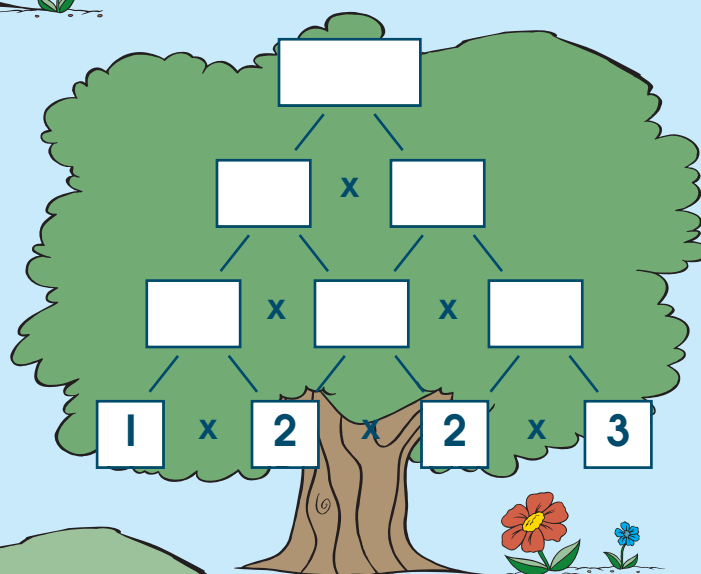
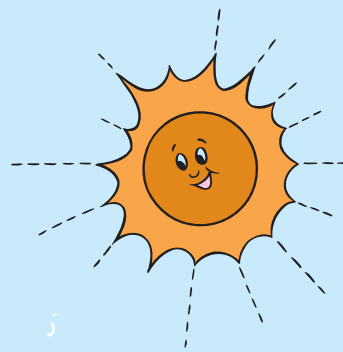
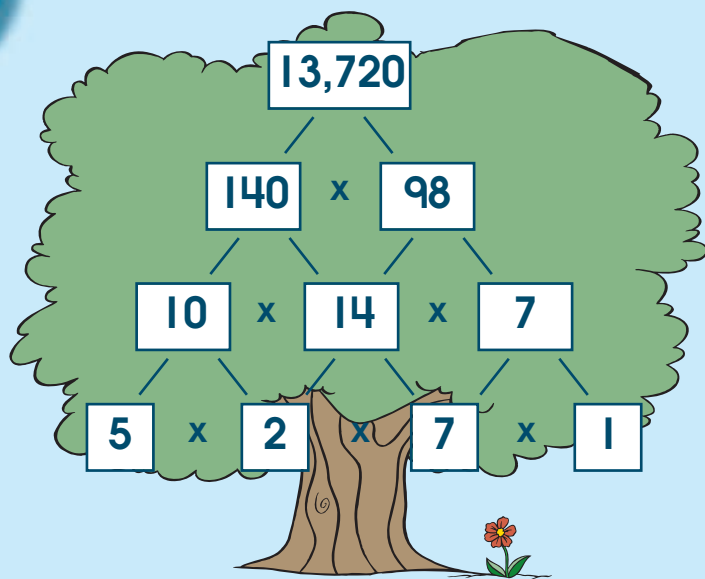


Directions: Fill in the numbers in the factor trees.



Factor Trees

Directions: Fill in the numbers in the factor trees. The first one is done for you.



Greatest Common Factor

Directions: Write the greatest common factor for each set of numbers.

10 and 35 _____

2 and 10 _____

42 and 63 _____

16 and 40 _____

25 and 55 _____

12 and 20 _____

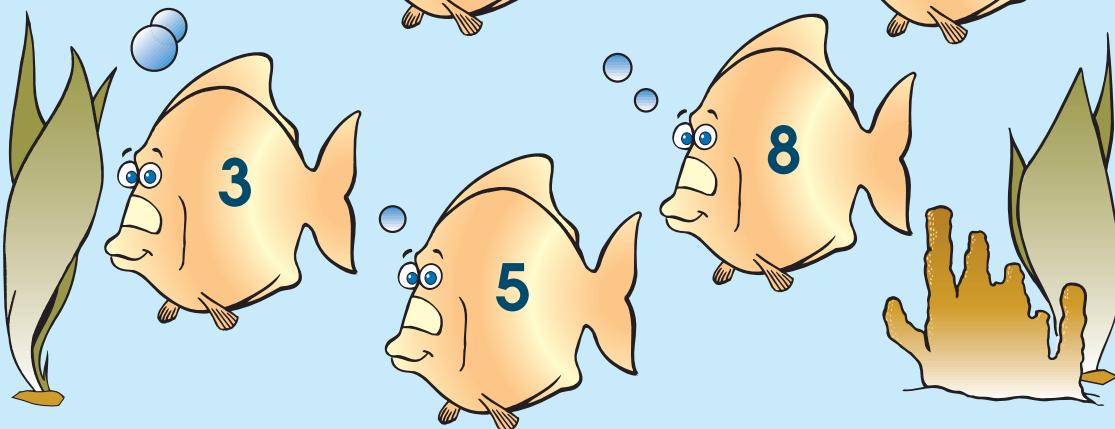
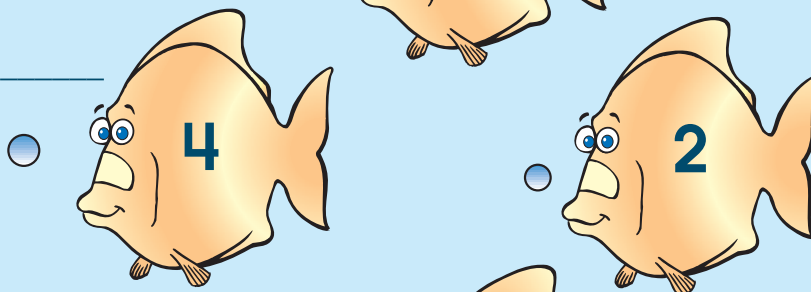
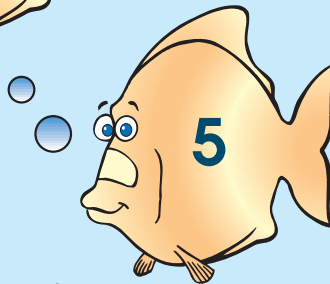
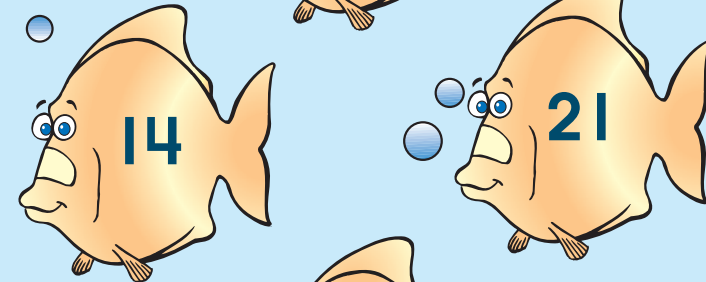
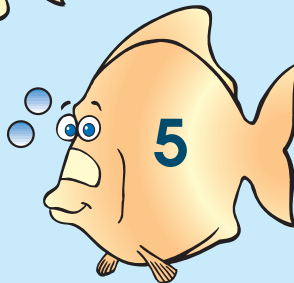
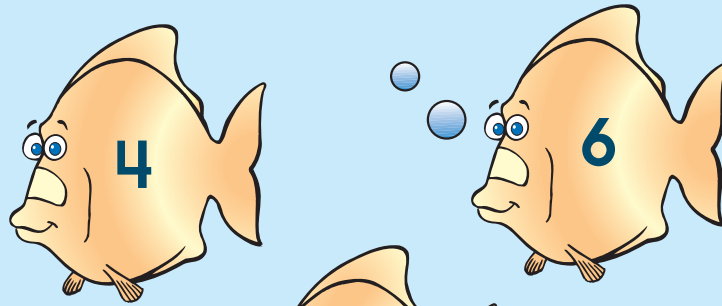
14 and 28 _____

8 and 20 _____

6 and 27 _____

15 and 35 _____

18 and 48 _____



Least Common Multiple

Directions: Write the least common multiple for each pair of numbers.

12 and 7 _____

2 and 4 _____

22 and 4 _____

6 and 10 _____

3 and 7 _____

6 and 8 _____

5 and 10 _____

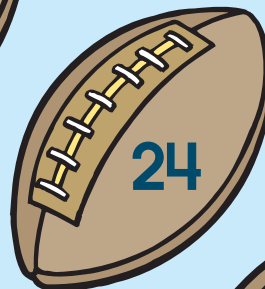
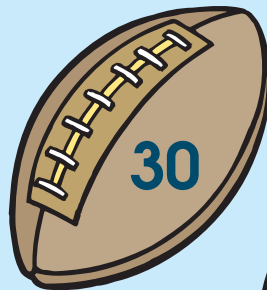
8 and 12 _____

9 and 15 _____

7 and 5 _____

3 and 8 _____

9 and 4 _____



Multiplication is a process of quick addition of a number a certain number of times.

Example: $3 \times 15 = 45$ is the same as adding 15 three times. $15 + 15 + 15 = 45$

Directions: Multiply.

$$\begin{array}{r} 32 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 48 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 26 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 19 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 63 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 251 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 523 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 915 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 431 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 275 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 412 \\ \times 21 \\ \hline \end{array}$$

$$\begin{array}{r} 643 \\ \times 17 \\ \hline \end{array}$$

$$\begin{array}{r} 526 \\ \times 22 \\ \hline \end{array}$$

$$\begin{array}{r} 742 \\ \times 35 \\ \hline \end{array}$$

Cathy is on the cross country team. She runs 3 miles every day except on her birthday. How many miles does she run each year?



Multiplication

Directions: Multiply.

Josh decided to join a book club. He received a new book every 2 weeks. He read 40 pages every night during the first 2 weeks in order to finish one book. How many pages did he read?



During the summer, he received 10 books in all. He read a total of 2,600 pages that summer. He read 65 pages each day that he read. How many days did it take him to read all 10 books?

The book company offered him a special deal. He could purchase five books for \$49.00. He decided to buy 25 books at this special price. How much money did he need to send with his order?

At the end of the year, Josh decided to share his books with a friend. His friend offered to pay him \$3.00 for each book, but he only had \$85.00 to spend. How many books could he buy?

$$\begin{array}{r} 247 \\ \times 15 \\ \hline \end{array}$$

$$\begin{array}{r} 483 \\ \times 72 \\ \hline \end{array}$$

$$\begin{array}{r} 826 \\ \times 43 \\ \hline \end{array}$$

$$\begin{array}{r} 359 \\ \times 58 \\ \hline \end{array}$$

$$\begin{array}{r} 735 \\ \times 21 \\ \hline \end{array}$$

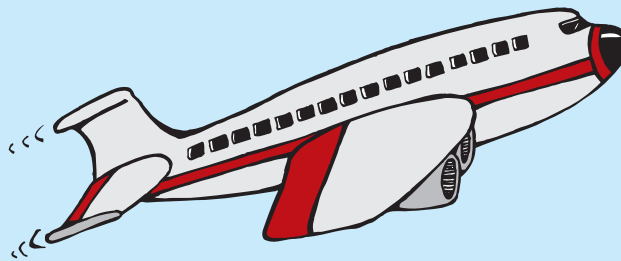
Multiplication

Be certain to keep the proper place value when multiplying by tens and hundreds.

Examples:

$$\begin{array}{r} 143 \\ \times 262 \\ \hline 286 \\ 858 \\ 286 \\ \hline 37,466 \end{array}$$

$$\begin{array}{r} 250 \\ \times 150 \\ \hline 000 \\ 1250 \\ 250 \\ \hline 37,500 \end{array}$$



Directions: Multiply.

$$\begin{array}{r} 701 \\ \times 308 \\ \hline \end{array}$$

$$\begin{array}{r} 621 \\ \times 538 \\ \hline \end{array}$$

$$\begin{array}{r} 348 \\ \times 200 \\ \hline \end{array}$$

$$\begin{array}{r} 537 \\ \times 189 \\ \hline \end{array}$$

$$\begin{array}{r} 416 \\ \times 727 \\ \hline \end{array}$$

$$\begin{array}{r} 682 \\ \times 472 \\ \hline \end{array}$$

$$\begin{array}{r} 878 \\ \times 638 \\ \hline \end{array}$$

$$\begin{array}{r} 267 \\ \times 196 \\ \hline \end{array}$$

$$\begin{array}{r} 893 \\ \times 214 \\ \hline \end{array}$$

An airplane flies 720 trips a year between the cities of Chicago and Columbus. Each trip is 375 miles. How many miles does the airplane fly each year?

Division is the reverse of multiplication. It is the process of dividing a number into equal groups of smaller numbers.



Directions: Divide.

Greg had 936 marbles to share with his two brothers. If the boys divided them evenly, how many will each one get? _____

The marbles Greg kept were four different colors: blue, green, red, and orange. He had the same number of each color. He divided them into two groups. One group had only orange marbles. The rest of the marbles were in the other group. How many marbles did he have in each group? orange _____ others _____

The **dividend** is the number to be divided by another number. In the problem $28 \div 7 = 4$, 28 is the dividend.

The **divisor** is the number by which another number is divided. In the problem $28 \div 7 = 4$, 7 is the divisor.

The **quotient** is the answer in a division problem. In the problem $28 \div 7 = 4$, 4 is the quotient.

The **remainder** is the number left over in the quotient of a division problem. In the problem $29 \div 7 = 4 \text{ r } 1$, 1 is the remainder.

Directions: Write the answers.

In the problem $25 \div 8 = 3 \text{ r } \dots$

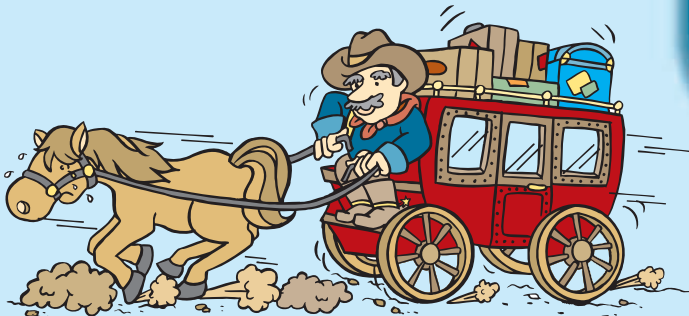
What is the divisor? _____ What is the remainder? _____

What is the quotient? _____ What is the dividend? _____

When dividing with remainders, the remainder must always be less than the divisor.

Example:

$$\begin{array}{r}
 241 \text{ r } 4 \\
 26 \overline{) 6,270} \\
 \underline{52} \\
 107 \\
 \underline{104} \\
 30 \\
 \underline{-26} \\
 4
 \end{array}$$



Directions: Divide.

$$53 \overline{) 1,220}$$

$$37 \overline{) 1,528}$$

$$83 \overline{) 6,270}$$

$$14 \overline{) 389}$$

$$29 \overline{) 2,645}$$

$$60 \overline{) 8,010}$$

$$35 \overline{) 2,546}$$

$$43 \overline{) 492}$$

$$83 \overline{) 4,608}$$

The Oregon Trail is 2,197 miles long. How long would it take a covered wagon traveling 20 miles a day to complete the trip?

Checking Division

Answers in division problems can be checked by multiplying.

Example:

$$\begin{array}{r} 481 \text{ r } 17 \\ 33 \overline{) 15,890} \\ \underline{132} \\ 269 \\ \underline{264} \\ 50 \\ \underline{33} \\ 17 \end{array}$$

$$\begin{array}{r} 481 \\ \times 33 \\ \hline 1443 \\ 1443 \\ \hline 15,873 \\ + 17 \\ \hline 15,890 \end{array}$$

Add the remainder



Directions: Divide and check your answers.

$61 \overline{) 2,736} \quad \text{Check:}$

$73 \overline{) 86,143} \quad \text{Check:}$

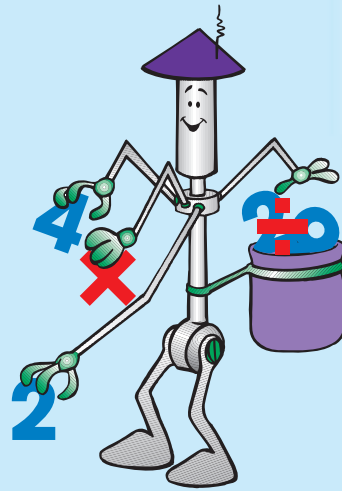
$59 \overline{) 9,390} \quad \text{Check:}$

$43 \overline{) 77,141} \quad \text{Check:}$

Denny has a baseball card collection. He has 13,789 cards. He wants to put the cards in a scrapbook that holds 15 cards on a page. How many pages does Denny need in his scrapbook?

An **equation** is a number sentence. To solve an equation, always work from left to right unless numbers are in parentheses.

Directions: Write the answers to these equations. The first one is done for you.



$$3 \times 2 + 4 + 9 = \underline{19}$$

$$4 \times 2 \times 8 \div 4 \times 2 = \underline{\quad}$$

$$9 \div 3 \times 5 \times 5 \times 2 = \underline{\quad}$$

$$7 \times 4 \times 3 \div 12 \times 8 = \underline{\quad}$$

$$20 \times 3 \div 6 \times 4 \div 5 = \underline{\quad}$$

$$32 \div 8 \times 4 \times 4 \div 2 = \underline{\quad}$$

$$52 \times 5 \times 2 \div 5 \times 7 = \underline{\quad}$$

Multiplication and Division

Directions: Multiply or divide to find the answers.

Brianne's summer job is mowing lawns for three of her neighbors. Each lawn takes about one hour to mow and needs to be done once every week. At the end of the summer, she will have earned a total of \$630. She collected the same amount of money from each job. How much did each neighbor pay for her summer lawn service?



If the mowing season lasts for 14 weeks, how much will Brianne earn for each job each week? _____

If she had worked for two more weeks, how much would she have earned? _____

Brianne agreed to shovel snow from the driveways and sidewalks for the same three neighbors. They agreed to pay her the same rate. However, it only snowed seven times that winter. How much did she earn shoveling snow? _____

What was her total income for both jobs? _____

Directions: Multiply or divide.

$32 \times 45 = \underline{\hspace{2cm}}$

$73 \times 14 = \underline{\hspace{2cm}}$

$92 \times 30 = \underline{\hspace{2cm}}$

$12 \overline{)7,476}$

$23 \overline{)21,620}$

$40 \overline{)32,600}$

Directions: Write the **LCM** of each pair of numbers.

5 and 6 _____ 2 and 6 _____

7 and 4 _____ 4 and 8 _____

Directions: Write the **GCF** of each pair of numbers.

12 and 9 _____ 18 and 9 _____

5 and 15 _____ 32 and 8 _____

Directions: Multiply.

$$\begin{array}{r} 836 \\ \times 329 \\ \hline \end{array}$$

$$\begin{array}{r} 537 \\ \times 248 \\ \hline \end{array}$$

$$\begin{array}{r} 916 \\ \times 35 \\ \hline \end{array}$$

$$\begin{array}{r} 7,328 \\ \times 468 \\ \hline \end{array}$$

Directions: Divide and check your answers.

$$27 \overline{)8,236} \quad \text{Check:}$$

$$93 \overline{)27,945} \quad \text{Check:}$$



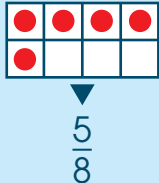
Adding and Subtracting Like Fractions

A **fraction** is a number that names part of a whole. Examples of fractions are $\frac{1}{2}$ and $\frac{1}{3}$. **Like fractions** have the same **denominator**, or bottom number. Examples of like fractions are $\frac{1}{4}$ and $\frac{3}{4}$.


To add or subtract fractions, the denominators must be the same. Add or subtract only the **numerators**, the numbers above the line in fractions.

Example:

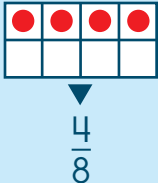
numerators	$\frac{5}{8}$	-	$\frac{1}{8}$	=	$\frac{4}{8}$	-	$\frac{1}{8}$	=	$\frac{4}{8}$
denominators	$\frac{5}{8}$		$\frac{1}{8}$		$\frac{4}{8}$		$\frac{1}{8}$		$\frac{4}{8}$



-



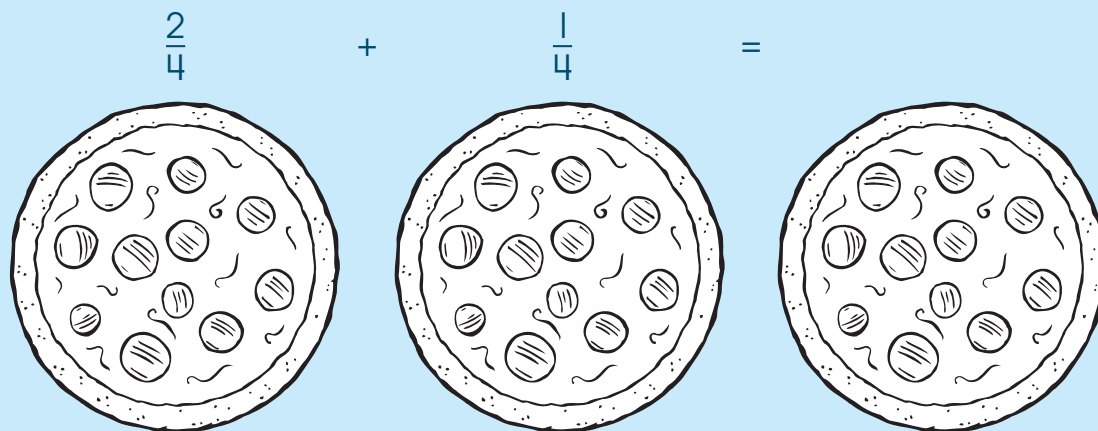
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Directions: Add or subtract these fractions.

$\frac{6}{12} - \frac{3}{12} =$	$\frac{4}{9} + \frac{1}{9} =$	$\frac{1}{3} + \frac{1}{3} =$	$\frac{5}{11} + \frac{4}{11} =$
$\frac{3}{5} - \frac{1}{5} =$	$\frac{5}{6} - \frac{2}{6} =$	$\frac{3}{4} - \frac{2}{4} =$	$\frac{5}{10} + \frac{3}{10} =$

Directions: Color the part of each pizza that equals the given fraction.



Adding and Subtracting Unlike Fractions

Unlike fractions have different denominators. Examples of unlike fractions are $\frac{1}{4}$ and $\frac{2}{5}$.

To add or subtract fractions, the denominators must be the same.

Example:

Step 1: Make the denominators the same by finding the least common denominator. The LCD of a pair of fractions is the same as the least common multiple (LCM) of their denominators.

$$\frac{1}{3} + \frac{1}{4} =$$

Multiples of 3 are 3, 6, 9, **12**, 15.
Multiples of 4 are 4, 8, **12**, 16.
LCM (and LCD) = 12

Step 2: Multiply by a number that will give the LCD. The numerator and denominator must be multiplied by the same number.

$$\frac{1}{3} \times \frac{4}{4} = \frac{4}{12}$$

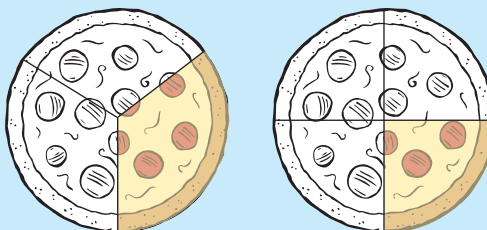
$$\frac{1}{4} \times \frac{3}{3} = \frac{3}{12}$$

Step 3: Add the fractions. $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$

Directions: Follow the above steps to add or subtract unlike fractions. Write the LCM.

$\frac{2}{4} + \frac{3}{8} =$ LCM = _____	$\frac{3}{6} + \frac{1}{3} =$ LCM = _____	$\frac{4}{5} - \frac{1}{4} =$ LCM = _____
--	--	--

The basketball team ordered two pizzas. They left $\frac{1}{3}$ of one and $\frac{1}{4}$ of the other. How much pizza was left?



Reducing Fractions

A fraction is in lowest terms when the GCF of both the numerator and denominator is 1. These fractions are in lowest possible terms: $\frac{2}{3}$, $\frac{5}{8}$, and $\frac{99}{100}$.

Example: Write $\frac{4}{8}$ in lowest terms.

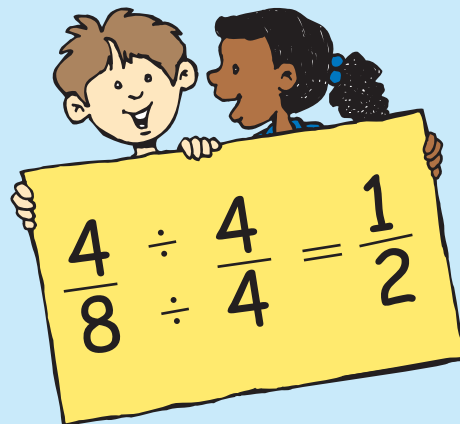
Step 1: Write the factors of 4 and 8.

Factors of 4 are **4, 2, 1**.

Factors of 8 are 1, 8, 2, **4**.

Step 2: Find the GCF: 4.

Step 3: Divide both the numerator and denominator by 4.



Directions: Write each fraction in lowest terms.

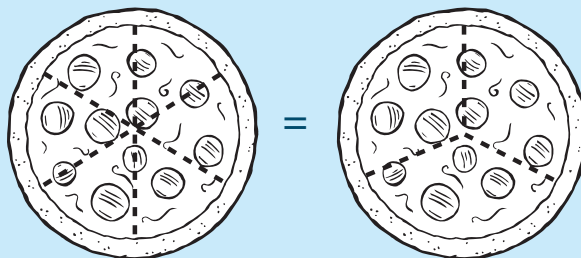
$$\frac{9}{12} = \text{_____ lowest terms}$$

factors of 9: _____, _____, _____

factors of 12: _____, _____, _____, _____, _____, _____, _____ GCF

$\frac{2}{6} =$	$\frac{10}{15} =$	$\frac{8}{32} =$	$\frac{4}{10} =$
$\frac{12}{18} =$	$\frac{6}{8} =$	$\frac{4}{6} =$	$\frac{3}{9} =$

Directions: Color the pizzas to show that $\frac{4}{6}$ in lowest terms is $\frac{2}{3}$.



Adding and Subtracting Unlike Fractions

Directions: Find the LCD, then add or subtract. Reduce your answer to lowest terms by dividing both the numerator and denominator by the GCF.

$$\frac{1}{3} - \frac{2}{9} =$$

$$\frac{5}{12} + \frac{1}{4} =$$

$$\frac{3}{8} + \frac{1}{2} =$$

LCD = _____

LCD = _____

LCD = _____

GCF = _____

GCF = _____

GCF = _____

lowest terms _____

lowest terms _____

lowest terms _____

$$\frac{8}{12} - \frac{1}{3} =$$

$$\frac{8}{15} - \frac{1}{5} =$$

$$\frac{4}{7} - \frac{4}{14} =$$

LCD = _____

LCD = _____

LCD = _____

GCF = _____

GCF = _____

GCF = _____

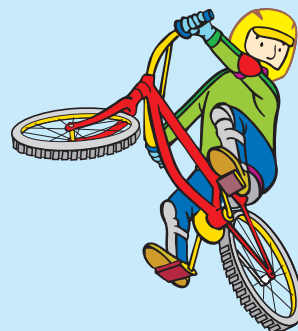
lowest terms _____

lowest terms _____

lowest terms _____

Joel and Jema competed in a bike race. After 30 minutes, Joel had finished $\frac{2}{3}$ of the race, and Jema had finished $\frac{7}{12}$ of the race. Who had finished more of the race?

How much more of the race had that person finished?



Improper Fractions

An **improper fraction** has a numerator that is greater than its denominator. An example of an improper fraction is $\frac{7}{5}$. An improper fraction should be reduced to its lowest terms.

Example: $\frac{5}{4}$ is an improper fraction because its numerator is greater than its denominator.

Step 1: Divide the numerator by the denominator: $5 \div 4 = 1, r1$

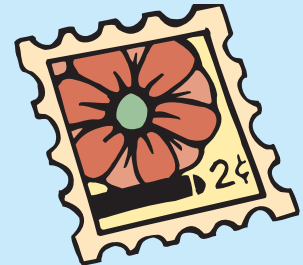
Step 2: Write the remainder as a fraction: $\frac{1}{4}$

$\frac{5}{4} = 1\frac{1}{4}$ $1\frac{1}{4}$ is a mixed number—a whole number and a fraction.

Directions: Follow the steps above to change the improper fractions to mixed numbers.

$\frac{21}{5} =$	$\frac{9}{4} =$	$\frac{3}{2} =$	$\frac{9}{6} =$	$\frac{25}{4} =$
------------------	-----------------	-----------------	-----------------	------------------

Sara had 29 duplicate stamps in her stamp collection. She decided to give them to four of her friends. If she gave each of them the same number of stamps, how many duplicates will she have left? _____



Name the improper fraction in this problem. _____

What step must you do next to solve the problem? _____

Write your answer as a mixed number. _____

How many stamps could she give each of her friends? _____

Mixed Numbers

A **mixed number** is a whole number and a fraction together. An example of a mixed number is $2\frac{3}{4}$. A mixed number can be changed to an improper fraction.

Example: $2\frac{3}{4}$

Step 1: Multiply the denominator by the whole number: $4 \times 2 = 8$

Step 2: Add the numerator: $8 + 3 = 11$

Step 3: Write the sum over the denominator: $\frac{11}{4}$

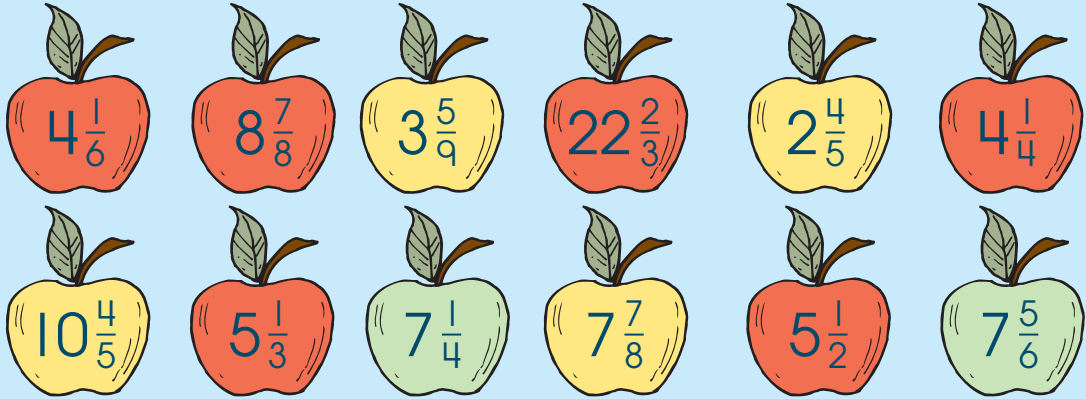
Directions: Follow the steps above to change the mixed numbers to improper fractions.



$3\frac{2}{3} =$	$6\frac{1}{5} =$	$4\frac{7}{8} =$	$2\frac{1}{2} =$
$1\frac{4}{5} =$	$5\frac{3}{4} =$	$7\frac{1}{8} =$	$9\frac{1}{9} =$
$12\frac{1}{5} =$	$25\frac{1}{2} =$	$10\frac{2}{3} =$	$14\frac{3}{8} =$

Improper Fractions and Mixed Numbers

Directions: Write the mixed number for each fraction. Reduce to lowest terms.



$$\frac{25}{6} = \underline{\hspace{2cm}}$$

$$\frac{14}{5} = \underline{\hspace{2cm}}$$

$$\frac{32}{9} = \underline{\hspace{2cm}}$$

$$\frac{68}{3} = \underline{\hspace{2cm}}$$

$$\frac{71}{8} = \underline{\hspace{2cm}}$$

$$\frac{54}{5} = \underline{\hspace{2cm}}$$

$$\frac{48}{9} = \underline{\hspace{2cm}}$$

$$\frac{17}{4} = \underline{\hspace{2cm}}$$

$$\frac{47}{6} = \underline{\hspace{2cm}}$$

$$\frac{11}{2} = \underline{\hspace{2cm}}$$

$$\frac{63}{8} = \underline{\hspace{2cm}}$$

$$\frac{29}{4} = \underline{\hspace{2cm}}$$

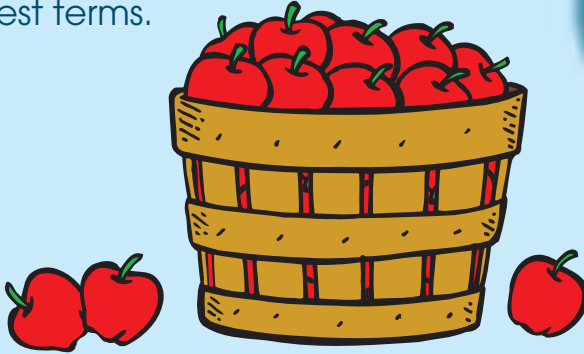
Adding Mixed Numbers

To add mixed numbers, first find the least common denominator.

Always reduce the answer to lowest terms.

Example:

$$\begin{array}{r} 5\frac{1}{4} \longrightarrow 5\frac{3}{12} \\ + 6\frac{1}{3} \longrightarrow + 6\frac{4}{12} \\ \hline 11\frac{7}{12} \end{array}$$



Directions: Add. Reduce the answers to lowest terms.

$$\begin{array}{r} 8\frac{1}{2} \\ + 7\frac{1}{4} \\ \hline \end{array}$$

$$\begin{array}{r} 5\frac{1}{4} \\ + 2\frac{3}{8} \\ \hline \end{array}$$

$$\begin{array}{r} 9\frac{3}{10} \\ + 7\frac{1}{5} \\ \hline \end{array}$$

$$\begin{array}{r} 8\frac{1}{5} \\ + 6\frac{7}{10} \\ \hline \end{array}$$

$$\begin{array}{r} 4\frac{4}{5} \\ + 3\frac{3}{10} \\ \hline \end{array}$$

$$\begin{array}{r} 3\frac{1}{2} \\ + 7\frac{1}{4} \\ \hline \end{array}$$

$$\begin{array}{r} 4\frac{1}{2} \\ + 1\frac{1}{3} \\ \hline \end{array}$$

$$\begin{array}{r} 6\frac{1}{12} \\ + 3\frac{3}{4} \\ \hline \end{array}$$

The boys picked $3\frac{1}{2}$ baskets of apples. The girls picked $5\frac{1}{2}$ baskets. How many baskets of apples did the boys and girls pick in all?

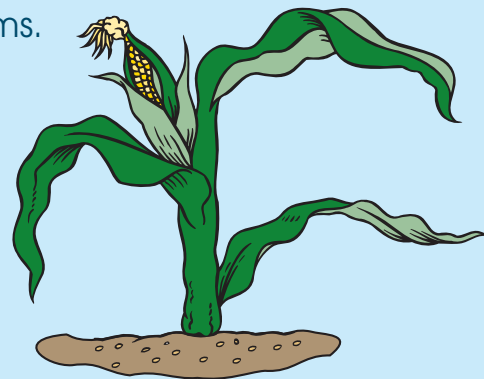
Subtracting Mixed Numbers

To subtract mixed numbers, first find the least common denominator. Reduce the answer to its lowest terms.

Directions: Subtract. Reduce to lowest terms.

Example:

$$\begin{array}{r} 6\frac{5}{8} \longrightarrow 6\frac{10}{16} \\ - 3\frac{4}{16} \longrightarrow - 3\frac{4}{16} \\ \hline 3\frac{6}{16} = 3\frac{3}{8} \end{array}$$



$$\begin{array}{r} 2\frac{3}{7} \\ - 1\frac{1}{14} \\ \hline \end{array}$$

$$\begin{array}{r} 7\frac{2}{3} \\ - 5\frac{1}{8} \\ \hline \end{array}$$

$$\begin{array}{r} 6\frac{3}{4} \\ - 2\frac{3}{12} \\ \hline \end{array}$$

$$\begin{array}{r} 9\frac{5}{12} \\ - 5\frac{9}{24} \\ \hline \end{array}$$

$$\begin{array}{r} 5\frac{1}{2} \\ - 3\frac{1}{3} \\ \hline \end{array}$$

$$\begin{array}{r} 7\frac{3}{8} \\ - 5\frac{1}{6} \\ \hline \end{array}$$

$$\begin{array}{r} 8\frac{3}{8} \\ - 6\frac{5}{12} \\ \hline \end{array}$$

$$\begin{array}{r} 11\frac{5}{6} \\ - 7\frac{1}{12} \\ \hline \end{array}$$

The Rodriguez Farm has $9\frac{1}{2}$ acres of corn.
The Johnson Farm has $7\frac{1}{3}$ acres of corn.
How many more acres of corn does the Rodriguez Farm have? _____

Directions: Match.

$$\frac{1}{4} + \frac{1}{3}$$

$$\frac{19}{8}$$

$$\frac{1}{5} - \frac{1}{6}$$

$$\frac{7}{5}$$

$$1\frac{1}{6}$$

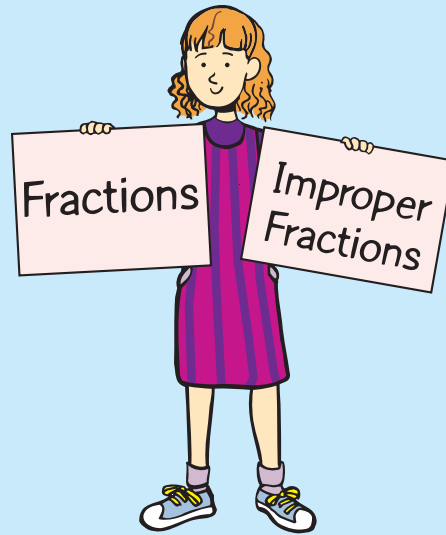
$$\frac{1}{30}$$

$$1\frac{2}{5}$$

$$\frac{7}{12}$$

$$2\frac{3}{8}$$

$$\frac{7}{6}$$



Directions: Change the improper fractions to mixed numbers.

$$\frac{12}{4} = \underline{\hspace{2cm}} \quad \frac{17}{5} = \underline{\hspace{2cm}} \quad \frac{13}{3} = \underline{\hspace{2cm}} \quad \frac{26}{3} = \underline{\hspace{2cm}} \quad \frac{18}{7} = \underline{\hspace{2cm}}$$

Directions: Change the mixed numbers to improper fractions.

$$5\frac{3}{5} = \underline{\hspace{2cm}} \quad 7\frac{1}{3} = \underline{\hspace{2cm}} \quad 6\frac{9}{10} = \underline{\hspace{2cm}} \quad 8\frac{3}{7} = \underline{\hspace{2cm}} \quad 10\frac{7}{8} = \underline{\hspace{2cm}}$$

Directions: Reduce these fractions to lowest terms.

$$\frac{4}{12} = \underline{\hspace{2cm}} \quad \frac{3}{9} = \underline{\hspace{2cm}} \quad \frac{6}{8} = \underline{\hspace{2cm}} \quad \frac{5}{10} = \underline{\hspace{2cm}} \quad \frac{9}{15} = \underline{\hspace{2cm}}$$

Directions: Add or subtract.

$$\begin{array}{r} 1\frac{1}{9} \\ + 2\frac{1}{3} \\ \hline \end{array} \quad \begin{array}{r} 5\frac{4}{5} \\ - 2\frac{3}{4} \\ \hline \end{array} \quad \begin{array}{r} 6\frac{1}{12} \\ + 5\frac{3}{4} \\ \hline \end{array} \quad \begin{array}{r} 12\frac{2}{3} \\ - 9\frac{1}{12} \\ \hline \end{array} \quad \begin{array}{r} 9\frac{1}{2} \\ + 8\frac{1}{3} \\ \hline \end{array}$$

Comparing Fractions

Directions: Use the symbol $>$ (greater than), $<$ (less than), or $=$ (equal to) to show the relationship between each pair of fractions.

$$\frac{1}{2} \quad \underline{\hspace{1cm}} \quad \frac{1}{3} \qquad \frac{2}{5} \quad \underline{\hspace{1cm}} \quad \frac{3}{7} \qquad \frac{3}{8} \quad \underline{\hspace{1cm}} \quad \frac{2}{4}$$

$$\frac{3}{4} \quad \underline{\hspace{1cm}} \quad \frac{6}{8} \qquad \frac{2}{3} \quad \underline{\hspace{1cm}} \quad \frac{4}{5} \qquad \frac{3}{9} \quad \underline{\hspace{1cm}} \quad \frac{1}{3}$$

$$\frac{3}{12} \quad \underline{\hspace{1cm}} \quad \frac{1}{4} \qquad \frac{2}{14} \quad \underline{\hspace{1cm}} \quad \frac{1}{7} \qquad \frac{5}{15} \quad \underline{\hspace{1cm}} \quad \frac{2}{3}$$

If Kelly gave $\frac{1}{3}$ of a pizza to Holly and $\frac{1}{5}$ to Diane, how much did she have left?

Holly decided to share $\frac{1}{2}$ of her share of the pizza with Deb. How much did each of them actually get?



Ordering Fractions

When putting fractions in order from smallest to largest or largest to smallest, it helps to find a common denominator first.



Example:

$$\frac{1}{3}, \frac{1}{2} \text{ changed to } \frac{2}{6}, \frac{3}{6}$$

Directions: Put the following fractions in order from least to largest value.

				Least					Largest
$\frac{1}{2}$	$\frac{2}{7}$	$\frac{4}{5}$	$\frac{1}{3}$	_____	_____	_____	_____	_____	_____
$\frac{3}{12}$	$\frac{3}{6}$	$\frac{1}{3}$	$\frac{3}{4}$	_____	_____	_____	_____	_____	_____
$\frac{2}{5}$	$\frac{4}{15}$	$\frac{3}{5}$	$\frac{5}{15}$	_____	_____	_____	_____	_____	_____
$3\frac{4}{5}$	$3\frac{2}{5}$	$\frac{9}{5}$	$3\frac{1}{5}$	_____	_____	_____	_____	_____	_____
$9\frac{1}{3}$	$9\frac{2}{3}$	$9\frac{9}{12}$	$8\frac{2}{3}$	_____	_____	_____	_____	_____	_____
$5\frac{8}{12}$	$5\frac{5}{12}$	$5\frac{4}{24}$	$5\frac{3}{6}$	_____	_____	_____	_____	_____	_____

Four dogs were selected as finalists at a dog show. They were judged in four separate categories. One received a perfect score in each area. The dog with a score closest to four is the winner. Their scores are listed below. Which dog won the contest? _____

Dog A $3\frac{4}{5}$

Dog B $3\frac{2}{3}$

Dog C $3\frac{5}{15}$

Dog D $3\frac{9}{12}$

Multiplying Fractions

To multiply fractions, follow these steps:

$$\frac{1}{2} \times \frac{3}{4} =$$

Step 1: Multiply the numerators.

$$1 \times 3 = 3$$

Step 2: Multiply the denominators.

$$2 \times 4 = 8$$

When multiplying a fraction by a whole number, first change the whole number to a fraction.

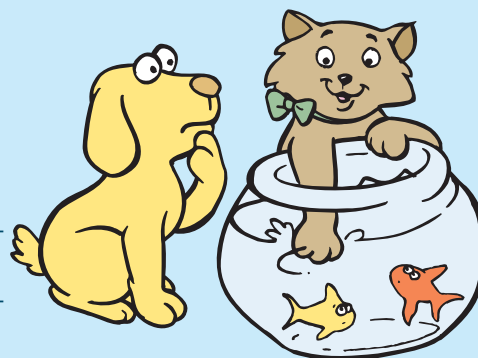
Example:

$$\frac{1}{2} \times 8 = \frac{1}{2} \times \frac{8}{1} = \frac{8}{2} = 4 \text{ reduced to lowest terms}$$

Directions: Multiply. Reduce your answers to lowest terms.

$\frac{1}{2} \times \frac{5}{8} =$	$\frac{2}{3} \times \frac{1}{2} =$	$\frac{5}{6} \times 4 =$	$\frac{3}{8} \times \frac{1}{16} =$
$\frac{7}{11} \times \frac{1}{3} =$	$\frac{2}{9} \times \frac{9}{4} =$	$\frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} =$	$\frac{1}{8} \times \frac{1}{4} \times \frac{1}{2} =$

Jennifer has 10 pets. Two-fifths of the pets are cats, $\frac{1}{2}$ are fish, and $\frac{1}{10}$ are dogs. How many of each pet does she have?



Multiplying Mixed Numbers

Multiply mixed numbers by first changing them to improper fractions. Always reduce your answers to lowest terms.

Example:

$$2\frac{1}{3} \times 1\frac{1}{8} = \frac{7}{3} \times \frac{9}{8} = \frac{63}{24} = 2\frac{15}{24} = 2\frac{5}{8}$$

Directions: Multiply. Reduce to lowest terms.

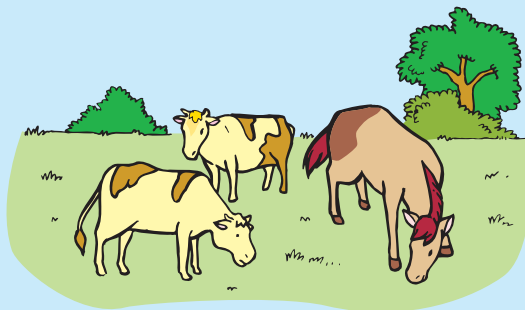
$1\frac{6}{7} \times 4\frac{1}{2} =$	$2\frac{3}{4} \times 2\frac{3}{5} =$	$4\frac{2}{3} \times 3\frac{1}{7} =$
$6\frac{2}{5} \times 2\frac{1}{8} =$	$3\frac{1}{7} \times 4\frac{5}{8} =$	$7\frac{3}{8} \times 2\frac{1}{9} =$

Sunnyside Farm has two barns with 25 stalls in each barn. Cows use $\frac{3}{5}$ of the stalls, and horses use the rest.

How many stalls are for cows?

How many are for horses?

(**Hint:** First, find how many total stalls are in the two barns.)



Dividing Fractions

To divide fractions, follow these steps:

$$\frac{3}{4} \div \frac{1}{4} =$$

Step 1: "Invert" the divisor. That means to turn it upside down.

$$\frac{3}{4} \div \frac{4}{1} =$$

Step 2: Multiply the two fractions:

$$\frac{3}{4} \times \frac{4}{1} = \frac{12}{4}$$

Step 3: Reduce the fraction to lowest terms by dividing the denominator into the numerator.

$$12 \div 4 = 3$$

$$\frac{3}{4} \div \frac{1}{4} = 3$$

Directions: Follow the above steps to divide fractions.

$\frac{1}{4} \div \frac{1}{5} =$	$\frac{1}{3} \div \frac{1}{12} =$	$\frac{3}{4} \div \frac{1}{3} =$
$\frac{5}{12} \div \frac{1}{3} =$	$\frac{3}{4} \div \frac{1}{6} =$	$\frac{2}{9} \div \frac{2}{3} =$
$\frac{3}{7} \div \frac{1}{4} =$	$\frac{2}{3} \div \frac{4}{6} =$	$\frac{1}{8} \div \frac{2}{3} =$



Dividing Whole Numbers by Fractions

Follow these steps to divide a whole number by a fraction:

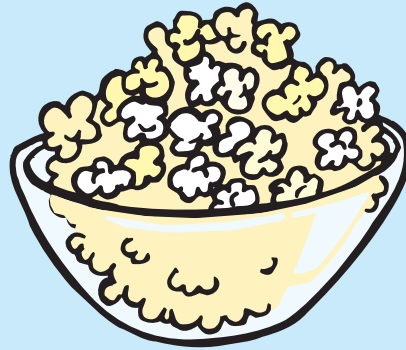
$$8 \div \frac{1}{4} =$$

Step 1: Write the whole number as a fraction:

$$\frac{8}{1} \div \frac{1}{4} =$$

Step 2: Invert the divisor.

$$\frac{8}{1} \div \frac{4}{1} =$$



Step 3: Multiply the two fractions:

$$\frac{8}{1} \times \frac{4}{1} = \frac{32}{1}$$

Step 4: Reduce the fraction to lowest terms by dividing the denominator into the numerator: $32 \div 1 = 32$

Directions: Follow the above steps to divide a whole number by a fraction.

$6 \div \frac{1}{3} =$	$4 \div \frac{1}{2} =$	$21 \div \frac{1}{3} =$
$9 \div \frac{1}{5} =$	$4 \div \frac{1}{9} =$	$12 \div \frac{1}{6} =$

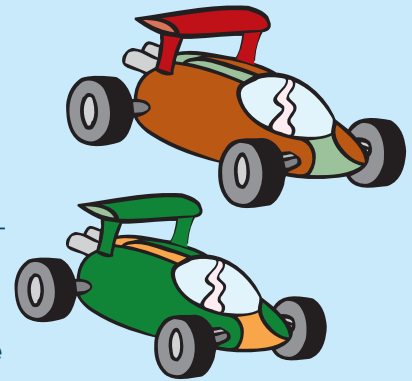
$\frac{3}{4}$ of a bag of popcorn fits into one bowl.
How many bowls do you need if you have six bags of popcorn? _____

Division Word Problems

Directions: Divide.

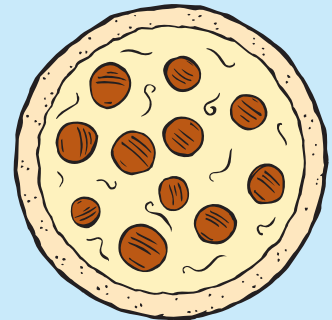
Brian has 2,000 small building blocks. He decided to share them with his cousin, Tina. He gave Tina $\frac{1}{4}$ of the blocks. How many blocks did he keep?

Tim has a collection of toy cars. His mother asked him to give $\frac{1}{3}$ of them to his sister, Tori. He gave Tori 135 cars. How many did he keep for himself?



How many did he have before giving some of them away?

Becky ordered two extra large pizzas for her four children. Each of the pizzas had been cut into 16 slices. If the children have equal servings, what fraction of the pizzas will each child get?



How many slices of pizza would that equal?

If normally takes Joel one hour to mow the yard. Today, he only completed $\frac{4}{5}$ of the job. How long did he work?

Decimals

A **decimal** is a number with one or more places to the right of a decimal point.

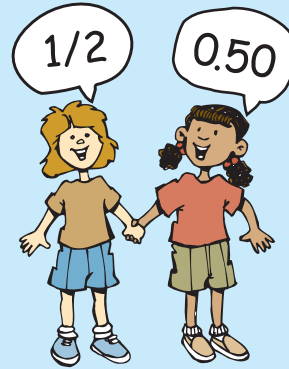
Examples: 6.5 and 2.25

Fractions with denominators of 10 or 100 can be written as decimals.

Examples:

$$\frac{7}{10} = .07 \quad \frac{0}{\text{ones}} . \frac{7}{\text{tenths}} \frac{0}{\text{hundredths}}$$

$$1 \frac{52}{100} = 1.52 \quad \frac{1}{\text{ones}} . \frac{5}{\text{tenths}} \frac{2}{\text{hundredths}}$$



Directions: Write the fractions as decimals.

$$\frac{1}{2} = \frac{\quad}{10} = 0.\underline{\quad}$$

$$\frac{2}{5} = \frac{\quad}{10} = 0.\underline{\quad}$$

$$\frac{1}{5} = \frac{\quad}{10} = 0.\underline{\quad}$$

$$\frac{3}{5} = \frac{\quad}{10} = 0.\underline{\quad}$$

$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{10}$
	$\frac{1}{4}$		$\frac{1}{10}$
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{10}$
	$\frac{1}{4}$		$\frac{1}{10}$
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{10}$
	$\frac{1}{4}$		$\frac{1}{10}$
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{10}$
	$\frac{1}{4}$		$\frac{1}{10}$

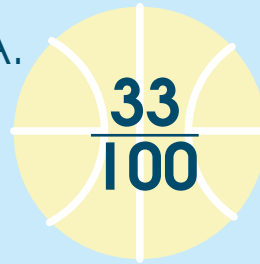
$\frac{63}{100} =$	$2 \frac{8}{10} =$	$38 \frac{4}{100} =$	$6 \frac{13}{100} =$
$5 \frac{2}{100} =$	$\frac{4}{25} =$	$15 \frac{3}{5} =$	$\frac{3}{100} =$

Decimals and Fractions

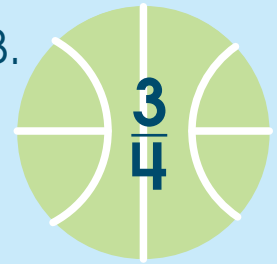
Directions: Write the letter of the fraction that is equal to the decimal.

$0.25 = \underline{\hspace{2cm}}$

A.



B.



$0.5 = \underline{\hspace{2cm}}$

$0.37 = \underline{\hspace{2cm}}$

$0.2 = \underline{\hspace{2cm}}$

$0.65 = \underline{\hspace{2cm}}$

$0.75 = \underline{\hspace{2cm}}$

$0.6 = \underline{\hspace{2cm}}$

$0.12 = \underline{\hspace{2cm}}$

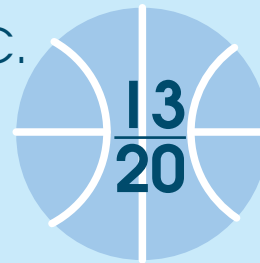
$0.33 = \underline{\hspace{2cm}}$

$0.95 = \underline{\hspace{2cm}}$

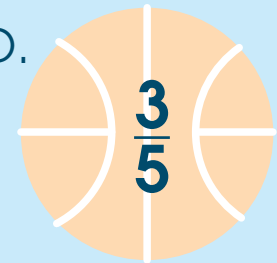
$0.3 = \underline{\hspace{2cm}}$

$0.4 = \underline{\hspace{2cm}}$

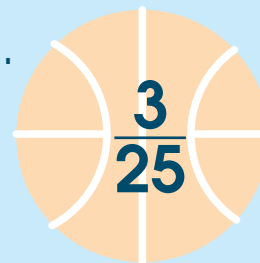
C.



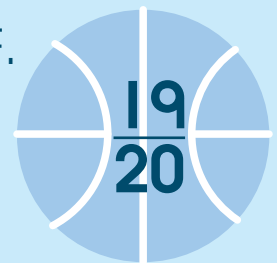
D.



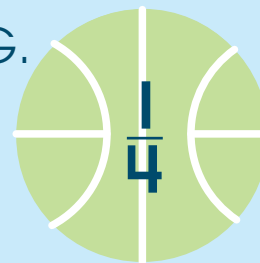
E.



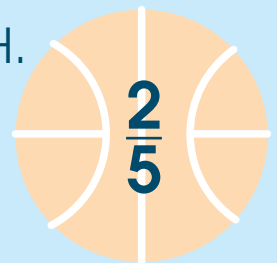
F.



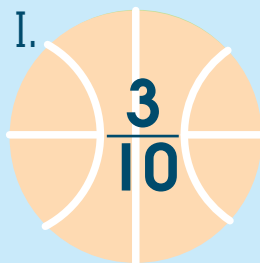
G.



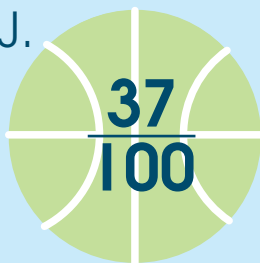
H.



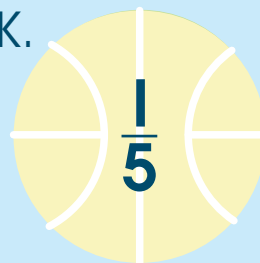
I.



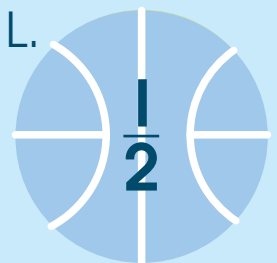
J.



K.



L.



Adding and Subtracting Decimals

A decimal is another way of writing a fraction. Decimals and fractions are numbers less than one.

Directions: Add or subtract. Remember to keep the decimal point in the proper place.

$$\begin{array}{r} 0.5 \\ + 0.8 \\ \hline \end{array}$$

$$\begin{array}{r} 0.35 \\ + 0.25 \\ \hline \end{array}$$

$$\begin{array}{r} 47.5 \\ - 32.7 \\ \hline \end{array}$$

$$\begin{array}{r} 85.7 \\ - 9.8 \\ \hline \end{array}$$

$$\begin{array}{r} 13.90 \\ + 4.23 \\ \hline \end{array}$$

$$\begin{array}{r} 9.53 \\ - 8.16 \\ \hline \end{array}$$

$$\begin{array}{r} 72.8 \\ - 63.9 \\ \hline \end{array}$$

$$\begin{array}{r} 6.43 \\ + 4.58 \\ \hline \end{array}$$

$$\begin{array}{r} 638.07 \\ - 19.34 \\ \hline \end{array}$$

$$\begin{array}{r} 811.060 \\ + 78.430 \\ \hline \end{array}$$

$$\begin{array}{r} 521.09 \\ - 148.75 \\ \hline \end{array}$$

Sean ran a 1-mile race in 5.58 minutes. Carlos ran it in 6.38 minutes. How much faster did Sean run?

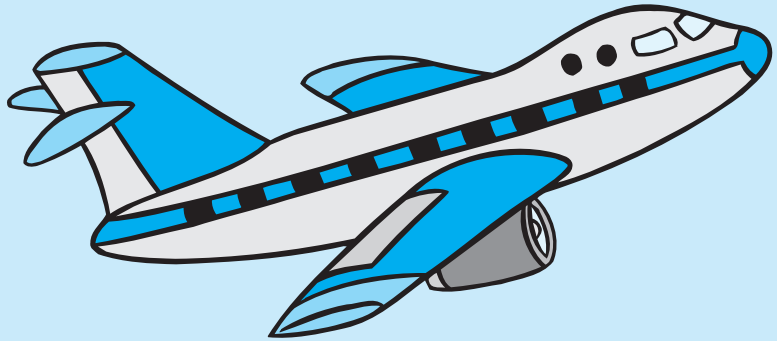


Multiplying Decimals

Multiply with decimals the same way you do with whole numbers. The decimal point moves in multiplication. Count the number of decimals in the problem and use the same number of decimals in your answer.

Example:

$$\begin{array}{r} 3.5 \\ \times 1.5 \\ \hline 175 \\ 35 \\ \hline 5.25 \end{array}$$



Directions: Multiply.

$$\begin{array}{r} 2.5 \\ \times 0.9 \\ \hline \end{array}$$

$$\begin{array}{r} 67.4 \\ \times 2.3 \\ \hline \end{array}$$

$$\begin{array}{r} 83.7 \\ \times 9.8 \\ \hline \end{array}$$

$$\begin{array}{r} 9.06 \\ \times 2.38 \\ \hline \end{array}$$

$$\begin{array}{r} 28.97 \\ \times 5.16 \\ \hline \end{array}$$

$$\begin{array}{r} 33.41 \\ \times 0.93 \\ \hline \end{array}$$

The jet flies 1.5 times faster than the plane with a propeller. The propeller plane flies 165.7 miles per hour. How fast does the jet fly?



Dividing With Decimals

When the dividend has a decimal, place the decimal point for the answer directly above the decimal point in the dividend. The first one is done for you.

$$\begin{array}{r} 12.5 \\ 3 \overline{) 37.5} \\ \underline{-3} \\ 07 \\ \underline{-6} \\ 15 \\ \underline{-15} \\ 0 \end{array}$$

$$4 \overline{) 34.4}$$

$$2 \overline{) 31.6}$$

$$5 \overline{) 187.5}$$

$$7 \overline{) 181.3}$$

$$6 \overline{) 340.8}$$

$$3 \overline{) 135.6}$$

$$5 \overline{) 264.5}$$

$$2 \overline{) 134.6}$$

$$5 \overline{) 35.25}$$

$$7 \overline{) 79.45}$$

$$9 \overline{) 28.71}$$

Dividing Decimals by Decimals

When the divisor has a decimal, you must eliminate it before dividing. You can do this by moving it to the right to create a whole number. You must also move the decimal the same number of spaces to the right in the dividend.

Sometimes, you need to add zeros to do this.

Example:

$$0.25 \overline{) 85.50} \quad \text{changes to} \quad \begin{array}{r} 342 \\ 25 \overline{) 8550} \\ \underline{-75} \\ 105 \\ \underline{-100} \\ 50 \\ \underline{-50} \\ 0 \end{array}$$

Directions: Divide.

$$0.3 \overline{) 27.9}$$

$$0.6 \overline{) 42.6}$$

$$0.9 \overline{) 81.9}$$

$$0.4 \overline{) 23.2}$$

$$0.7 \overline{) 56.7}$$

$$1.2 \overline{) 10.8}$$

$$12.6 \overline{) 5,670}$$

$$4.7 \overline{) 564}$$

$$8.6 \overline{) 842.8}$$

$$5.9 \overline{) 1,917.5}$$

$$4.3 \overline{) 1,376}$$

$$2.9 \overline{) 922.2}$$

Review

Directions: Multiply. Reduce to lowest terms.

$\frac{1}{4} \times \frac{1}{5} =$	$\frac{5}{8} \times \frac{3}{10} =$	$\frac{2}{9} \times \frac{3}{4} =$
$5\frac{1}{4} \times 3\frac{1}{5} =$	$3\frac{3}{4} \times 2\frac{1}{7} =$	$4\frac{1}{6} \times 3\frac{3}{5} =$

Directions: Divide. Reduce to lowest terms.

$5 \div \frac{1}{5} =$	$18 \div \frac{1}{9} =$	$8 \div \frac{1}{3} =$
$18 \div \frac{1}{4} =$	$63 \div \frac{5}{8} =$	$42 \div \frac{1}{5} =$

Directions: Write these fractions as decimals.

$\frac{7}{100} =$ _____ $\frac{2}{5} =$ _____ $37\frac{3}{10} =$ _____

Directions: Add or subtract.

$$\begin{array}{r} 14.5 \\ + 3.8 \\ \hline \end{array}$$

$$\begin{array}{r} 26.93 \\ - 18.45 \\ \hline \end{array}$$

$$\begin{array}{r} 137.092 \\ - 98.135 \\ \hline \end{array}$$

Directions: Multiply.

$$\begin{array}{r} 83.3 \\ \times 0.6 \\ \hline \end{array}$$

$$\begin{array}{r} 42.91 \\ \times 2.03 \\ \hline \end{array}$$

$$\begin{array}{r} 12.3 \\ \times 0.7 \\ \hline \end{array}$$

Geometry is the branch of mathematics that has to do with points, lines, and shapes.

Directions: Use the Glossary on pages 107 and 108 if you need help. Write the word from the box that is described below.

triangle	square	cube	angle
line	ray	segment	rectangle

a collection of points on a straight path that goes on and on in opposite directions



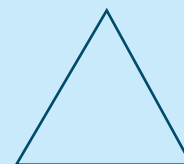
a figure with three sides and three corners



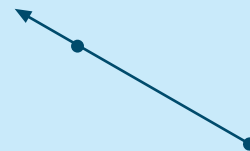
a figure with four equal sides and four corners



part of a line that has one end point and goes on and on in one direction



part of a line having two end points



a space figure with six square faces



two rays with a common end point

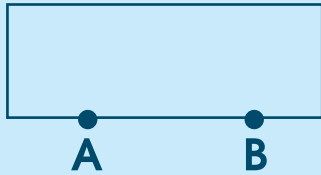


a figure with four corners and four sides

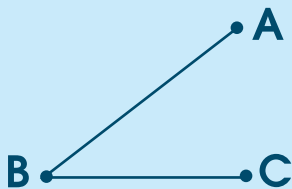


Review the definitions on the previous page before completing the problems below.

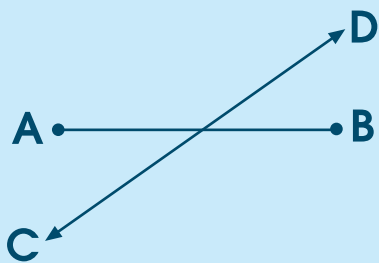
Directions: Identify the labeled section of each of the following diagrams.



AB = _____

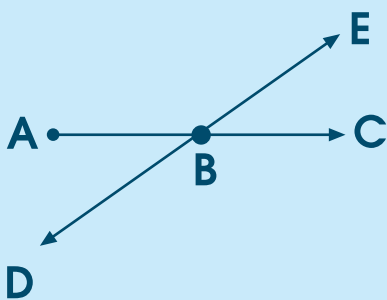


ABC = _____



AB = _____

CD = _____



AC = _____

AB = _____

EBC = _____

BC = _____

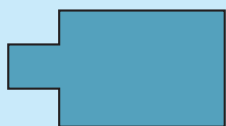
Similar, Congruent, and Symmetrical Figures

Similar figures have the same shape but have varying sizes.

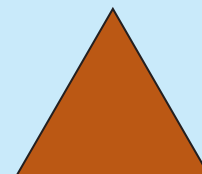
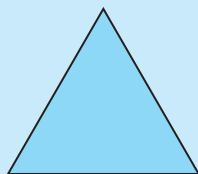
Figures that are **congruent** have identical shapes but different orientations. That means they face in different directions.

Symmetrical figures can be divided equally into two identical parts.

Directions: Cross out the shape that does not belong in each group. Label the two remaining shapes as similar, congruent, or symmetrical.







Perimeter and Area

The **perimeter (P)** of a figure is the distance around it. To find the perimeter, add the lengths of the sides.

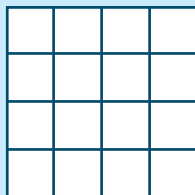
The **area (A)** of a figure is the number of units in a figure. Find the area by multiplying the length of a figure by its width.



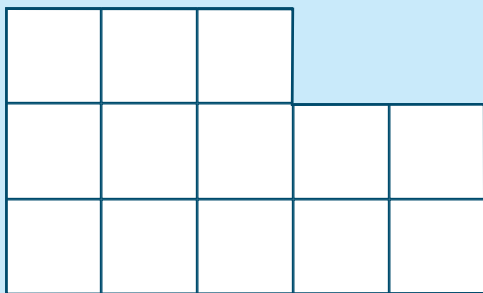
Example:

$$P = 16 \text{ units}$$

$$A = 16 \text{ units}$$

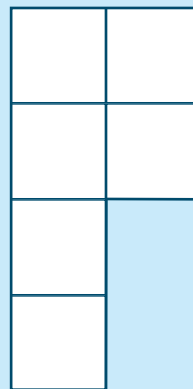


Directions: Find the perimeter and area of each figure.



$$P = \underline{\hspace{2cm}}$$

$$A = \underline{\hspace{2cm}}$$



$$P = \underline{\hspace{2cm}}$$

$$A = \underline{\hspace{2cm}}$$



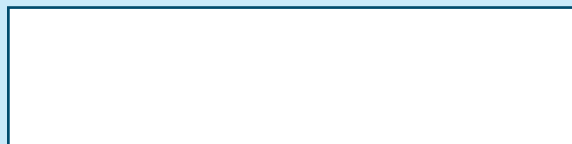
9 Yards

9 Yards

$$P = \underline{\hspace{2cm}}$$

$$A = \underline{\hspace{2cm}}$$

2 Miles



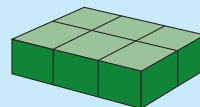
45 Miles

$$P = \underline{\hspace{2cm}}$$

$$A = \underline{\hspace{2cm}}$$

The **volume** of a figure is the number of cubic units inside it.

Example: Volume = 6 cubic units



Directions: Draw figures to show the volumes given. Use the dot pattern to help you. The first one is done for you.

1 cubic unit

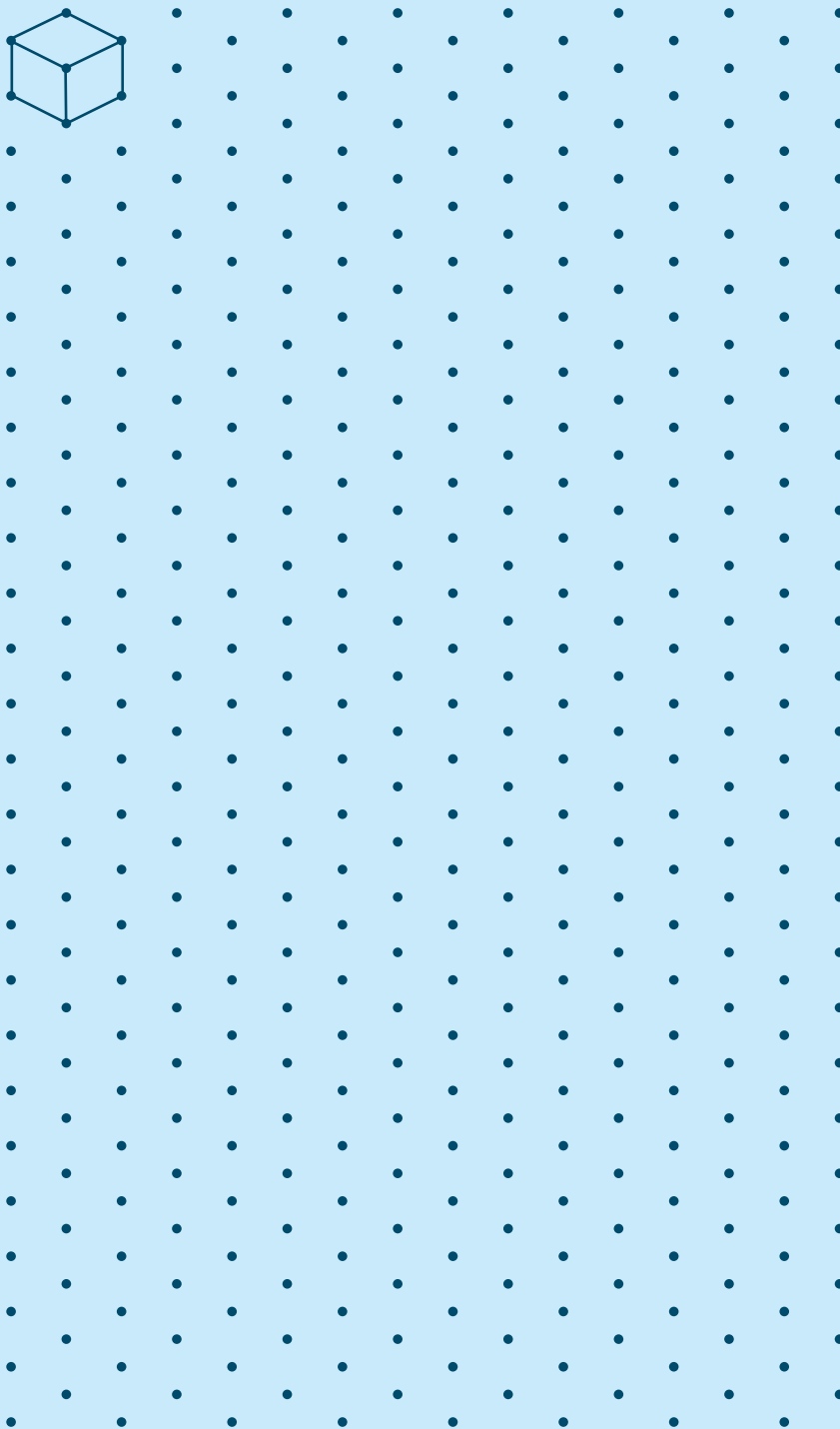


3 cubic units

5 cubic units

6 cubic units

7 cubic units



The formula for finding the volume of a box is length times width times height (**L x W x H**). The answer is given in cubic units.

Directions: Solve the problems.

Example:

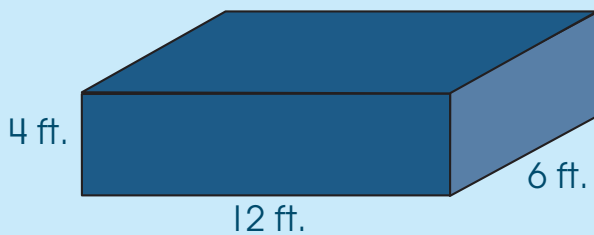
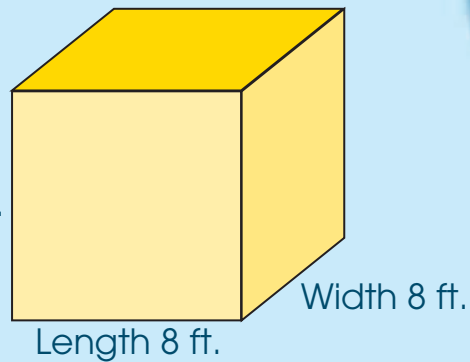
Height 8 ft.

Length 8 ft.

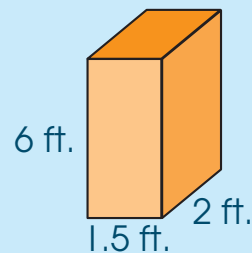
Width 8 ft.

L x W x H = volume

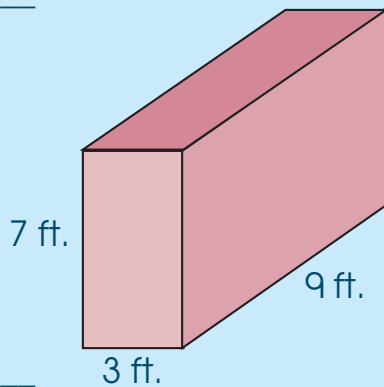
$$8' \times 8' \times 8' = 512 \text{ cubic ft. or } 512 \text{ ft.}^3$$



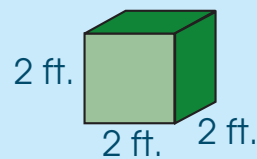
V = _____



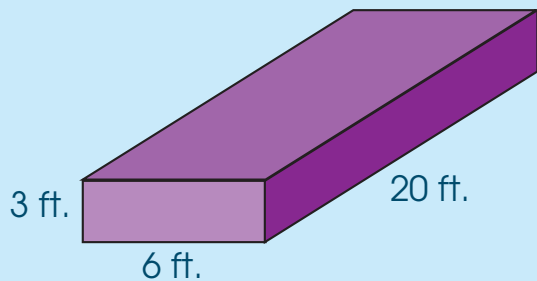
V = _____



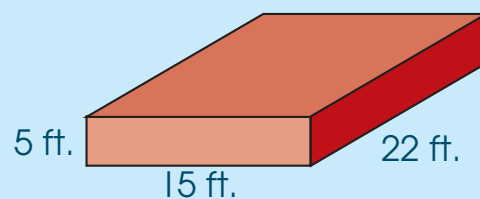
V = _____



V = _____



V = _____

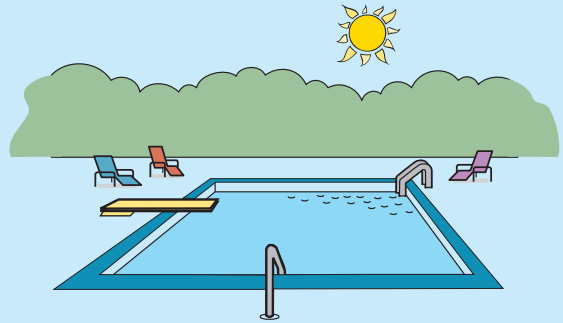


V = _____ ft.³

Perimeter and Area

Directions: Use the formulas for finding perimeter and area to solve these problems.

Julie's family moved to a new house. Her parents said she could have the largest bedroom. Julie knew she would need to find the perimeter of each room to find which one was largest.



One rectangular bedroom is 7 feet wide and 12 feet long. Another is 11 feet long and 9 feet wide. The third bedroom is a square. It is 9 feet wide and 9 feet long. Which one should she select to have the largest room?

The new home also has a swimming pool in the backyard. It is 32 feet long and 18 feet wide. What is the perimeter of the pool?

Julie's mother wants to plant flowers on each side of the new house. She will need three plants for every foot of space. The house is 75 feet across the front and back and 37.5 feet along each side. Find the perimeter of the house.

How many plants should she buy? _____

The family decided to buy new carpeting for several rooms. Complete the necessary information to determine how much carpeting to buy.

Den: 12 ft. x 14 ft. = _____ sq. ft.

Master Bedroom: 20 ft. x _____ = 360 sq. ft.

Family Room: _____ x 25 ft. = 375 sq. ft.

Total square feet of carpeting: _____

Directions: Find the perimeter and area.

1. Length = 8 ft.

Width = 11 ft.

P = _____ A = _____

2. Length = 12 ft.

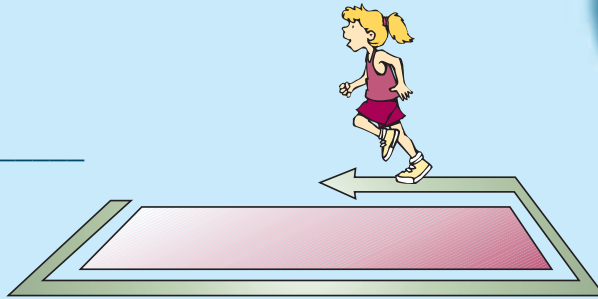
Width = 10 ft.

P = _____ A = _____

3. Length = 121 ft.

Width = 16 ft.

P = _____ A = _____



Directions: Find the perimeter, area, and volume.

4. Length = 7 ft.

Width = 12 ft.

Height = 10 ft.

P = _____

A = _____

V = _____

6. Length = 12 in.

Width = 15 in.

Height = 20 in.

P = _____

A = _____

V = _____

5. Length = 48 in.

Width = 7 ft.

Height = 12 in.

P = _____

A = _____

V = _____

7. Length = 22 ft.

Width = 40 ft.

Height = 10 ft.

P = _____

A = _____

V = _____

Circumference

Circumference is the distance around a circle. The **diameter** is a line segment that passes through the center of a circle and has both end points on the circle.

To find the circumference of any circle, multiply 3.14 times the diameter. The number 3.14 represents **pi** (pronounced *pie*) and is often written by this Greek symbol, π .

The formula for circumference is $C = \pi \times d$

C = circumference

d = diameter

$\pi = 3.14$

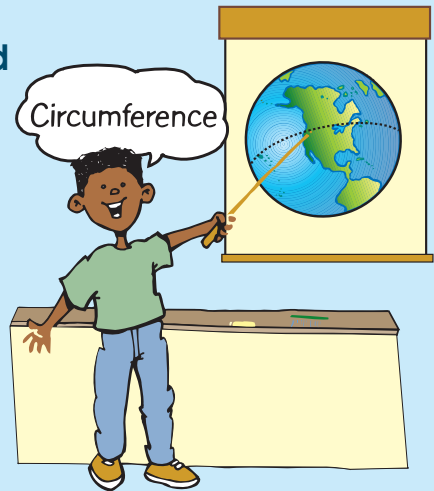
Example:

Circle A

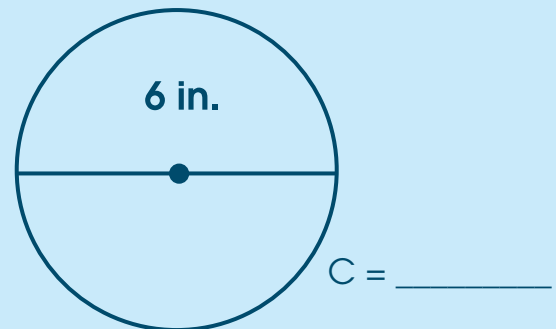
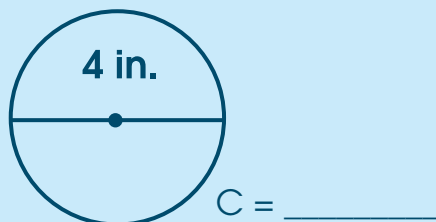
$d = 2$ in.

$C = 3.14 \times 2$ in.

$C = 6.28$ in.



Directions: Find the circumference of each circle.



$d = 10$ in.

$C =$ _____

$d = 14$ in.

$C =$ _____

$d = 3$ yd.

$C =$ _____

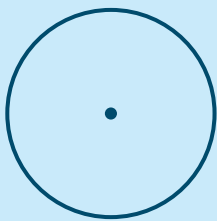
Circumference

The **radius** of a circle is the distance from the center of the circle to its outside edge. The diameter equals two times the radius.

Find the circumference by multiplying π (3.14) times the diameter or by multiplying π (3.14) times $2r$ (2 times the radius).

$C = \pi \times d$ or $C = \pi \times 2r$

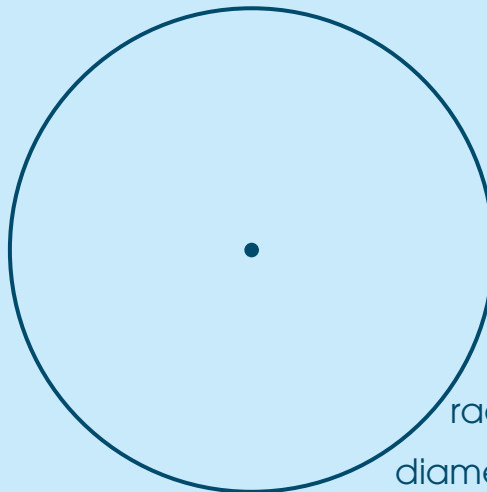
Directions: Write the missing radius, diameter, or circumference.



radius 3

diameter _____

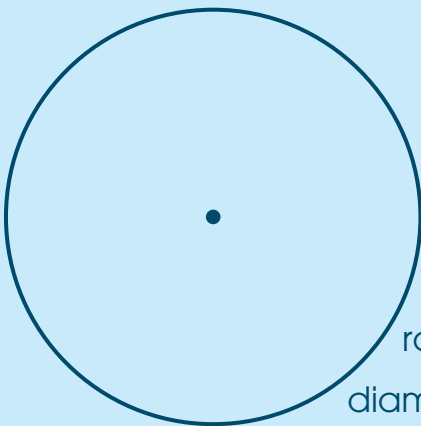
circumference _____



radius _____

diameter 14

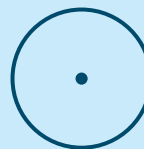
circumference _____



radius _____

diameter 12

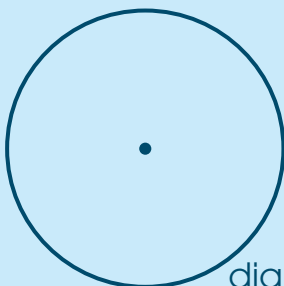
circumference _____



radius 2

diameter _____

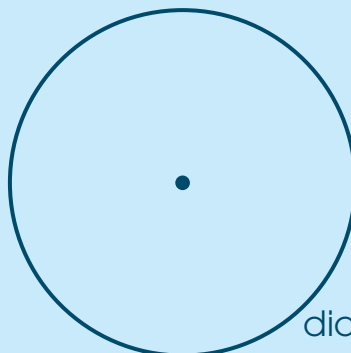
circumference _____



radius _____

diameter 8

circumference _____



radius 5

diameter _____

circumference _____

Diameter, Radius, and Circumference

Directions: Write the missing radius, diameter, or circumference.

Katie was asked to draw a circle on the playground for a game during recess. If the radius of the circle needed to be 14 inches, how long is the diameter? _____

What is the circumference? _____

Jamie was creating an art project. He wanted part of it to be a sphere. He measured 24 inches for the diameter.

What would the radius of the sphere be? _____

Find the circumference. _____



Unfortunately, Jamie discovered that he didn't have enough material to create a sphere that large, so he cut the dimensions in half. What are the new dimensions for his sphere?

Radius _____

Diameter _____

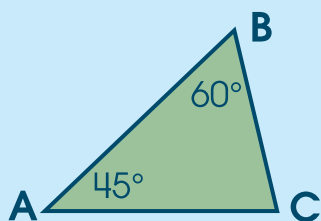
Circumference _____

Triangle Angles

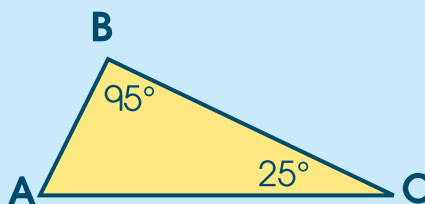
A **triangle** is a figure with three corners and three sides. Every triangle contains three angles. The sum of the angles is always 180, regardless of the size or shape of the triangle.

If you know two of the angles, you can add them together, then subtract the total from 180 to find the number of degrees in the third angle.

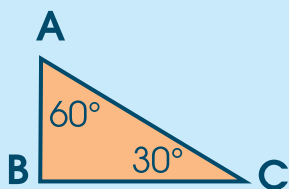
Directions: Find the number of degrees in the third angle of each triangle.



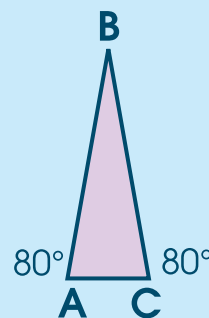
$$C = \underline{\hspace{2cm}}$$



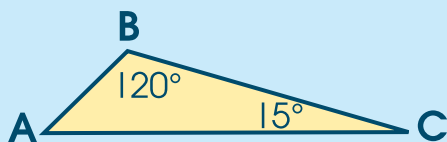
$$A = \underline{\hspace{2cm}}$$



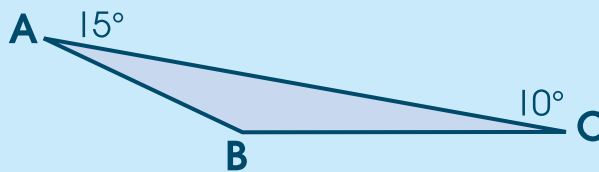
$$A = \underline{\hspace{2cm}}$$



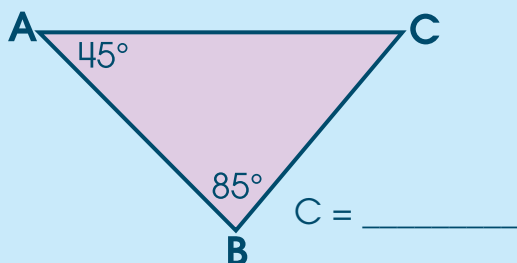
$$B = \underline{\hspace{2cm}}$$



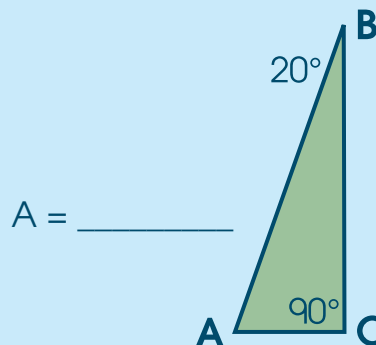
$$A = \underline{\hspace{2cm}}$$



$$B = \underline{\hspace{2cm}}$$



$$C = \underline{\hspace{2cm}}$$



$$A = \underline{\hspace{2cm}}$$

Area of a Triangle

The area of a triangle is found by multiplying $\frac{1}{2}$ times the base times the height.

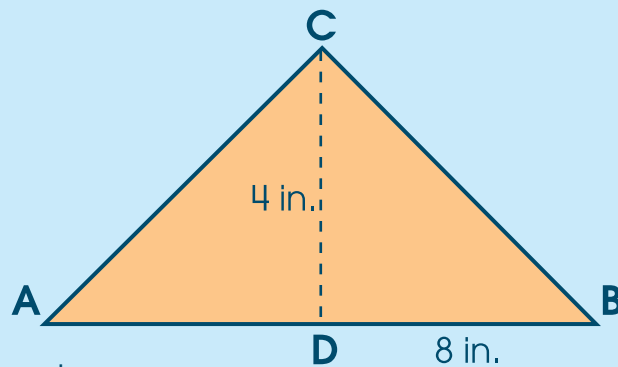
$$A = \frac{1}{2} \times b \times h$$

Example:

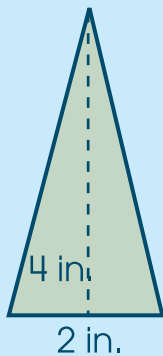
\overline{CD} is the height. 4 in.

\overline{AB} is the base. 8 in.

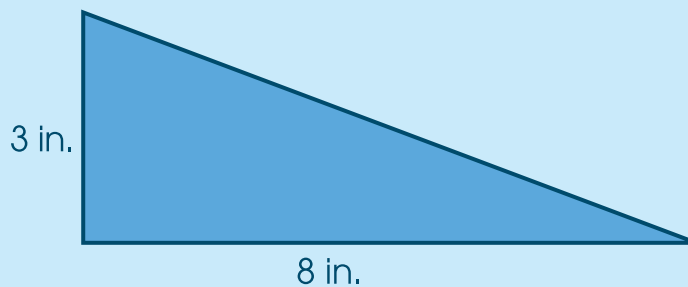
$$\text{Area} = \frac{1}{2} \times 4 \times 8 = \frac{32}{2} = 16 \text{ sq. in.}$$



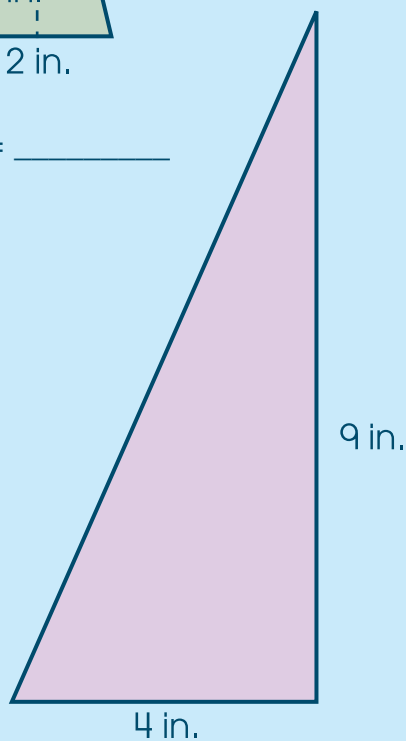
Directions: Find the area of each triangle.



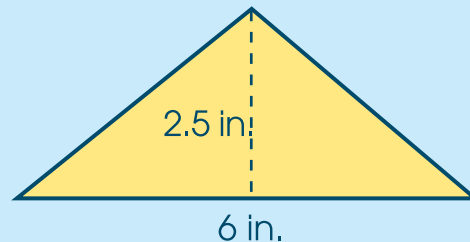
$$A = \underline{\hspace{2cm}}$$



$$A = \underline{\hspace{2cm}}$$



$$A = \underline{\hspace{2cm}}$$



$$A = \underline{\hspace{2cm}}$$

Estimating Area

Estimating area means giving an approximate number of square units in a figure.

Example: The Andrews family is building a swimming pool. To find out how much material they will need, they must estimate the area of the pool.

Step 1: Count the number of whole squares: 14

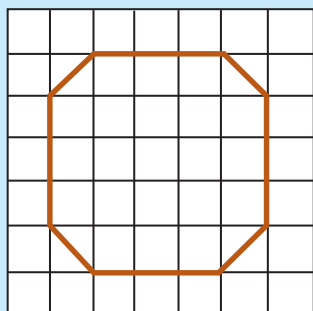
Step 2: Count the number of partial squares: 12

Step 3: Divide the number of partial squares by 2: 6

Step 4: Add $\frac{1}{2}$ the number of the partial squares to the number of whole squares. Round to the nearest whole number.

$$14 + 6 = 20$$

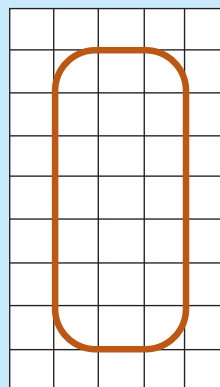
Directions: Follow the steps to estimate the area of each figure. Round the answer to the nearest whole number.



whole units 21

partial units 4

A = _____



whole units 17

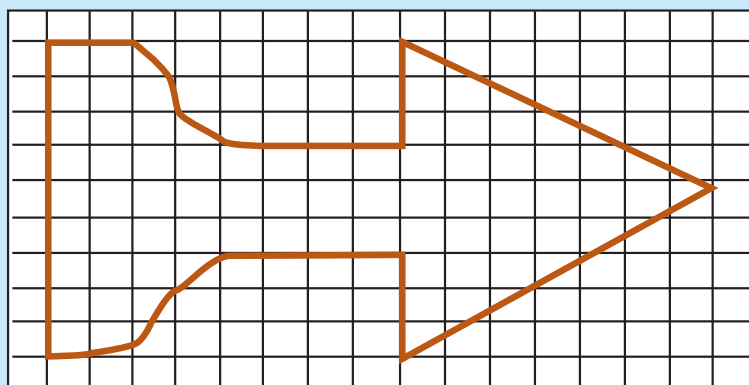
partial units 4

A = _____

whole units _____

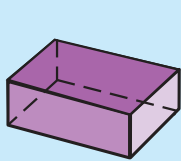
partial units _____

A = _____



Space Figures

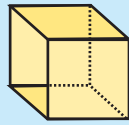
Space figures are figures whose points are in more than one plane. Cubes and cylinders are space figures.



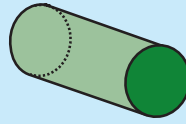
rectangular
prism



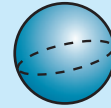
cone



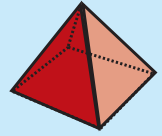
cube



cylinder



sphere



pyramid

A **prism** has two identical, parallel bases.

All of the faces on a **rectangular prism** are rectangles.

A **cube** is a prism with six identical, square faces.

A **pyramid** is a space figure whose base is a polygon and whose faces are triangles with a common vertex—the point where two rays meet.

A **cylinder** has a curved surface and two parallel bases that are identical circles.

A **cone** has one circular, flat face and one vertex.

A **sphere** has no flat surface. All points are an equal distance from the center.

Directions: Circle the name of the figure you see in each of these familiar objects.



cone

sphere

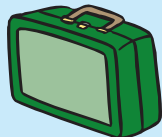
cylinder



cone

sphere

cylinder



cube

rectangular prism

pyramid

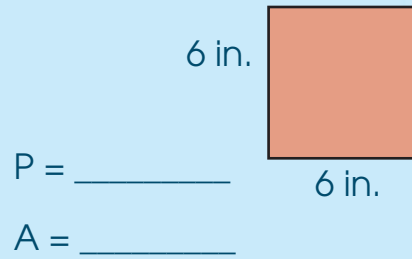
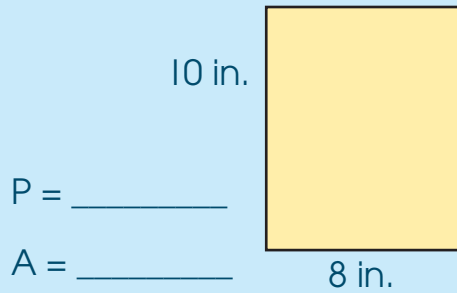


cone

pyramid

cylinder

Directions: Find the perimeter and area of each figure.



Directions: Find the circumference of each circle.

D = 3 in.

D = 5 ft.

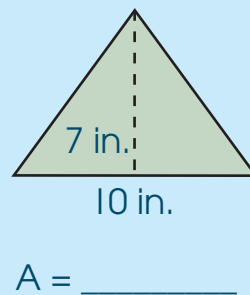
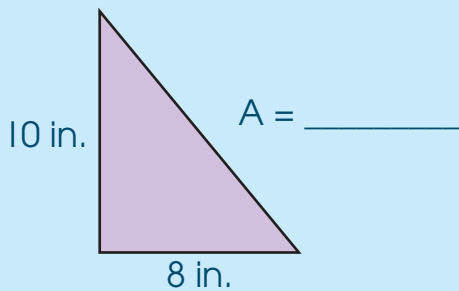
D = 6 yd.

C = _____

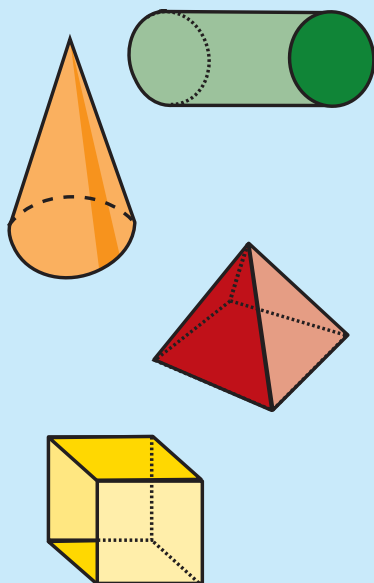
C = _____

C = _____

Directions: Find the area of each triangle.



Directions: Draw a line from the space figure to its name.



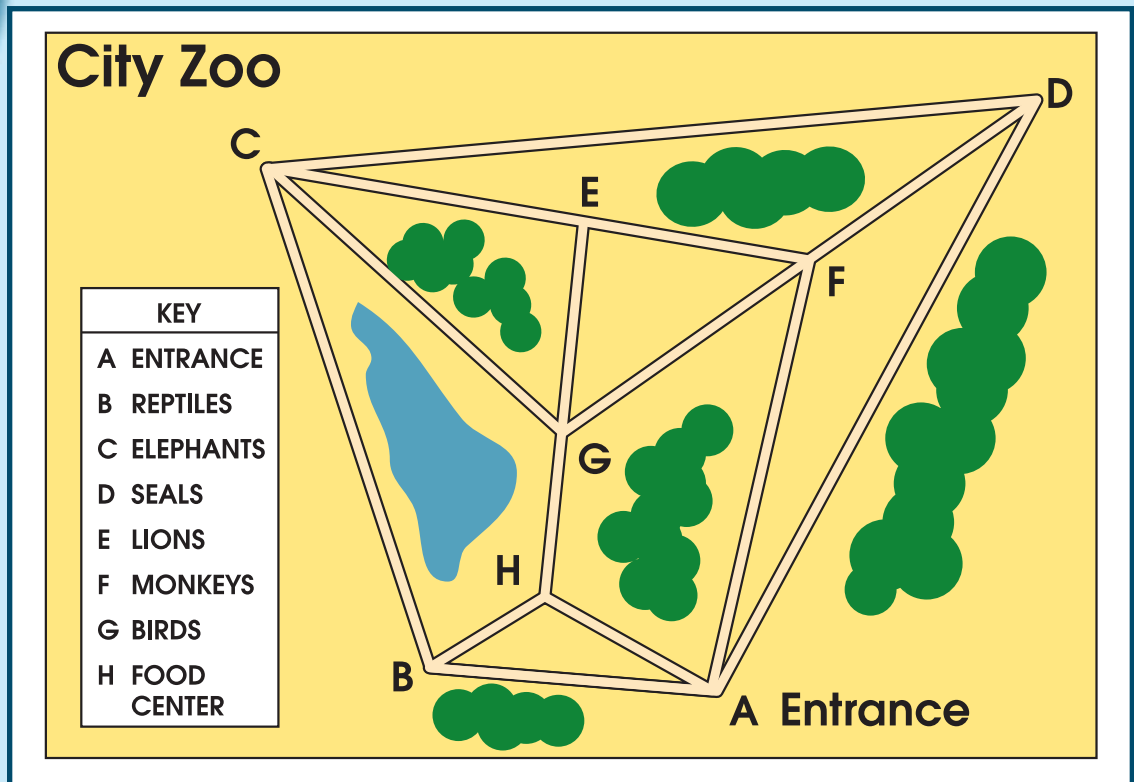
cone

pyramid

cylinder

cube

Directions: Use the map to help plan a day at the zoo.



The class is going to the zoo. They want to see the elephants, monkeys, lions, and birds before lunch at the food center. What is a logical path to travel from A to H to see the animals?

A → _____ E → _____ G → H

What path would you take to see the seals, reptiles, and monkeys before leaving the zoo?

Directions: Use the map on the previous page to answer these questions.

What is the shortest path to follow from the front gate in order to see the elephants, monkeys, and birds?

Traveling from the food center, which animal arena is farthest away? _____

Which is closest? _____

Which animals would you see if you only traveled the path on the perimeter of the zoo?

What shape would you create if you followed the path from A to D to F and back to A?

Is it possible to create a square by following any of the paths? If so, which ones?

Length

Inches, feet, yards, and miles are used to measure length in the United States.


12 inches = 1 foot (ft.)

3 feet = 1 yard (yd.)

36 inches = 1 yard

1,760 yards = 1 mile (mi.)

Directions: Circle the best unit to measure each object. The first one is done for you.

the length of a  inches feet yards miles

the height of a  inches feet yards miles

the length of a  inches feet yards miles

distance to the  inches feet yards miles

the length of a  inches feet yards miles

Length

Units of measure can be converted (changed) from one unit to another.

Example: The distance from the teacher's desk to the door is 24 feet.

$$24 \text{ ft.} = \underline{8 \text{ yd.}}$$

Directions: Convert the units of measure using the conversions on the previous page.

The distance from the plants to the computer is 5 yd.

$$5 \text{ yd.} = \underline{\hspace{2cm}} \text{ ft.}$$

The teacher's desk is 5 ft. long.

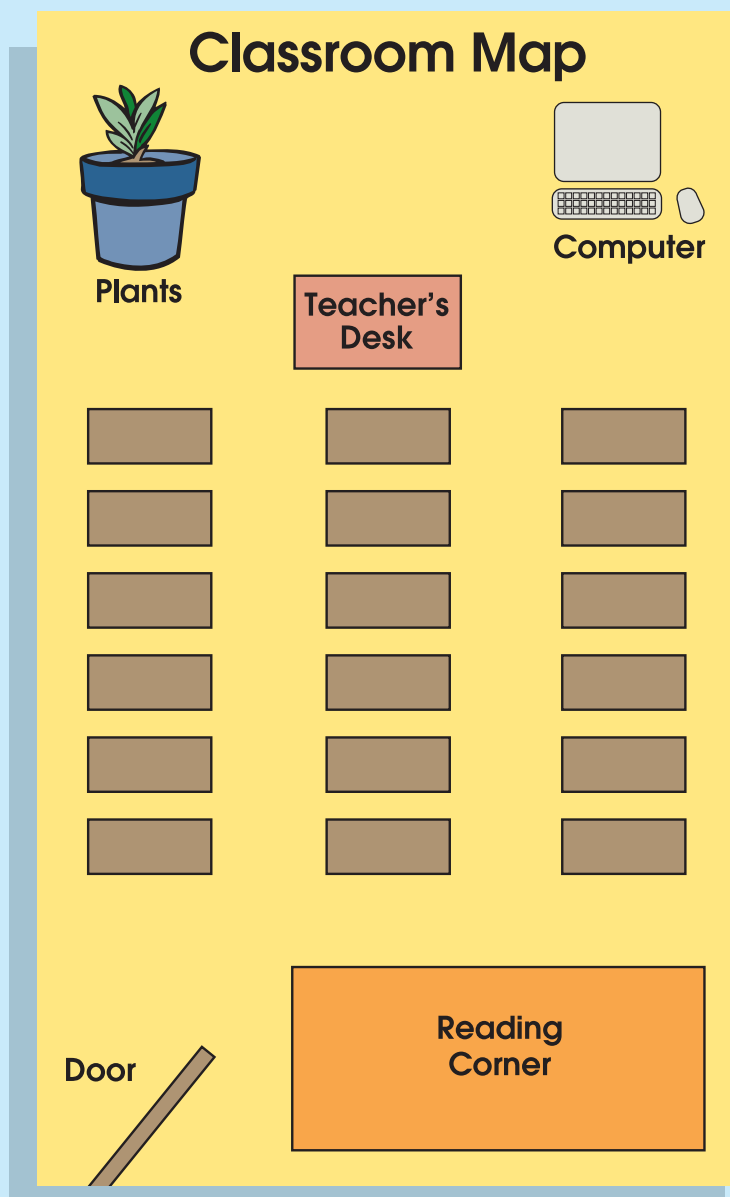
$$5 \text{ ft.} = \underline{\hspace{2cm}} \text{ in.}$$

The reading corner is 3 yd. wide.

$$3 \text{ yd.} = \underline{\hspace{2cm}} \text{ in.}$$

The distance from the computer to the door is 9 yd.

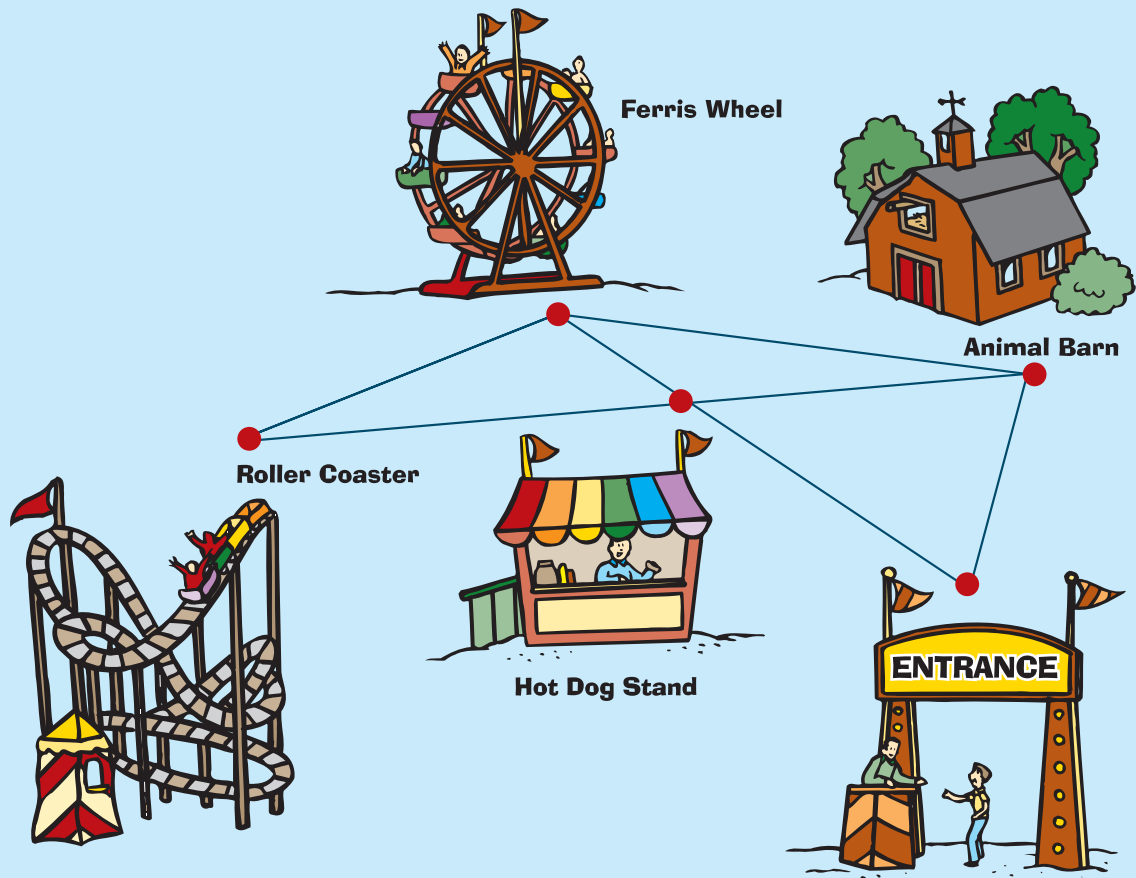
$$9 \text{ yd.} = \underline{\hspace{2cm}} \text{ ft.}$$



Length

Directions: Use a ruler to find the shortest paths. Round your measurement to the nearest quarter inch. Then, convert to yards using the scale.

Scale: 1 inch = 100 yards



Hot dog stand to the roller coaster

The Ferris wheel to the animal barn

Entrance to roller coaster

Ferris wheel to roller coaster to entrance

Millimeters, centimeters, meters, and kilometers are used to measure length in the metric system.

1 meter = 39.37 inches

1 kilometer = about $\frac{5}{8}$ mile

10 millimeters = 1 centimeter (cm)

100 centimeters = 1 meter (m)

1,000 meters = 1 kilometer (km)

Directions: Circle the best unit to measure each object. The first one is done for you.

the length of a  centimeters meters kilometers

the height of a  centimeters meters kilometers

the length of a  centimeters meters kilometers

distance to the  centimeters meters kilometers

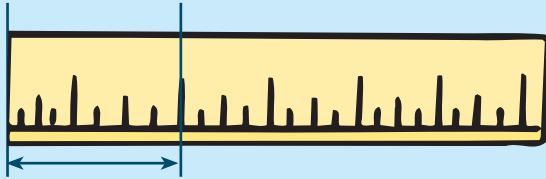
the length of a  centimeters meters kilometers

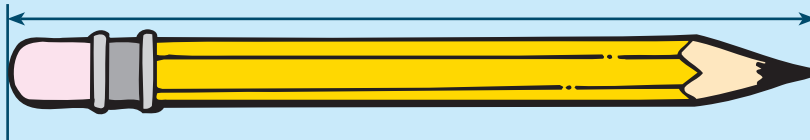
Length: Metric

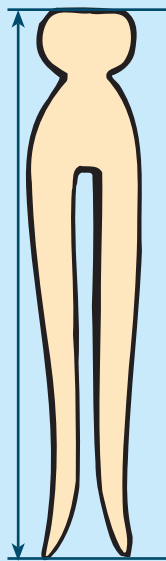
2.54 centimeters = 1 inch

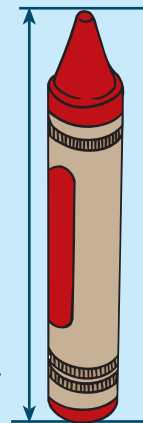
1 millimeter = $\frac{1}{10}$ centimeter

Directions: Use a metric ruler to measure the length of each object.

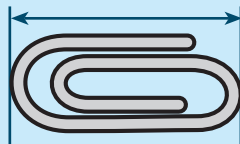












Ounces, pounds, and tons are used to measure weight in the United States.

16 ounces = 1 pound (lb.)

2,000 pounds = 1 ton (tn.)

Directions: Circle the most reasonable estimate for the weight of each object. The first one is done for you.



10 ounces

10 pounds

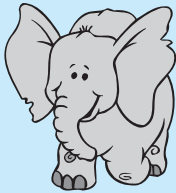
10 tons



6 ounces

6 pounds

6 tons



2 ounces

2 pounds

2 tons



3 ounces

3 pounds

3 tons



1,800 ounces

1,800 pounds

1,800 tons



1 ounce

1 pound

1 ton

Weight: Metric

Grams and **kilograms** are units of weight in the metric system. A paper clip weighs about 1 gram. A kitten weighs about 1 kilogram.

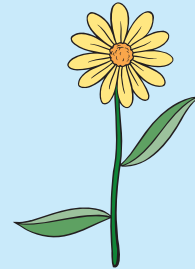
1 kilogram (kg) = about 2.2 pounds

1,000 grams (g) = 1 kilogram

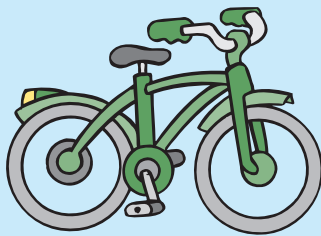
Directions: Circle the best unit to weigh each object.



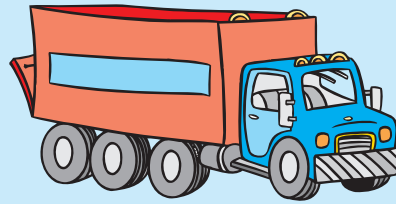
kilogram
gram



kilogram
gram



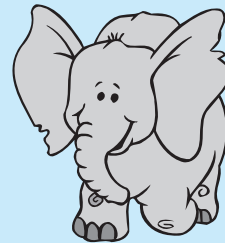
kilogram
gram



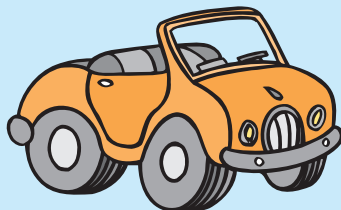
kilogram
gram



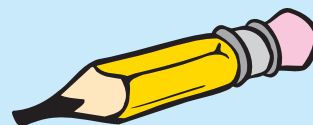
kilogram
gram



kilogram
gram



kilogram
gram



kilogram
gram

The **fluid ounce**, **cup**, **pint**, **quart**, and **gallon** are used to measure capacity in the United States.

8 fluid ounces (fl. oz.) = 1 cup (c.)

2 cups = 1 pint (pt.)

2 pints = 1 quart (qt.)

2 quarts = 1 half gallon ($\frac{1}{2}$ gal.)

4 quarts = 1 gallon (gal.)



1 cup



1 pint



1 quart



1 half gallon



1 gallon

Directions: Convert the units of capacity.

13 gal. = _____ qt.

10 pt. = _____ c.

12 c. = _____ pt.

4 gal. = _____ qt.

16 qt. = _____ gal.

5 c. = _____ pt.

36 pt. = _____ gal.

12 qt. = _____ pt.

6 gal. = _____ pt.

16 c. = _____ qt.

32 oz. = _____ c.

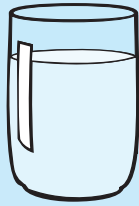
16 oz. = _____ pt.

Capacity: Metric

Milliliters and **liters** are units of capacity in the metric system. A can of soda contains about 350 milliliters of liquid. A large plastic bottle contains 1 liter of liquid. A liter is about a quart.

$$1,000 \text{ milliliters (mL)} = 1 \text{ liter (L)}$$

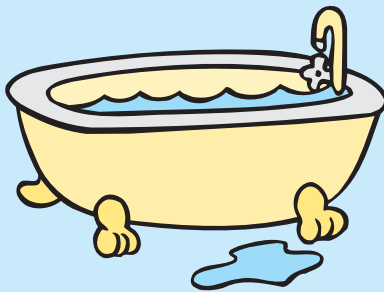
Directions: Circle the best unit to measure each liquid.



milliliters
liters



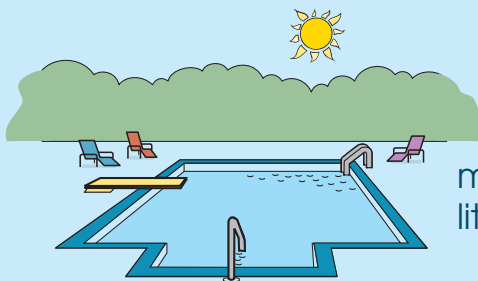
milliliters
liters



milliliters
liters



milliliters
liters



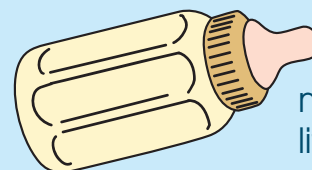
milliliters
liters



milliliters
liters



milliliters
liters



milliliters
liters

Comparing Measurements

Directions: Use the symbols greater than (>), less than (<), or equal to (=) to complete each statement.



10 inches _____ 10 centimeters

40 feet _____ 120 yards

25 grams _____ kilograms

16 quarts _____ 4 gallons

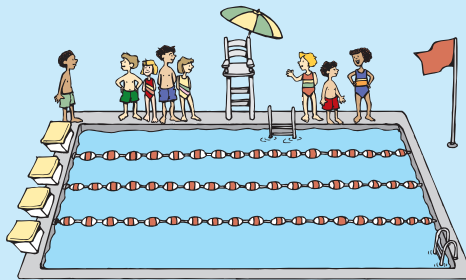
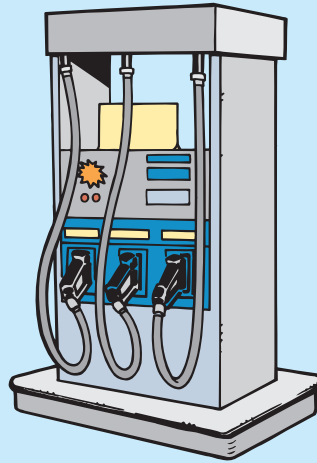
2 liters _____ 2 milliliters

16 yards _____ 6 meters

3 miles _____ 3 kilometers

20 centimeters _____ 20 meters

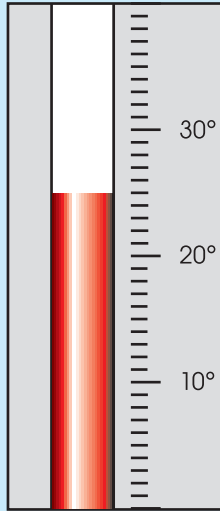
85 kilograms _____ 8 grams



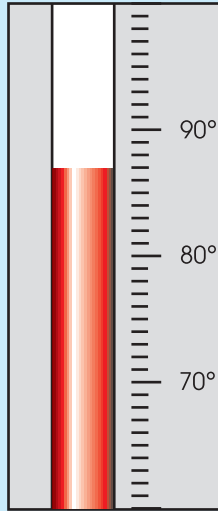
Temperature: Fahrenheit

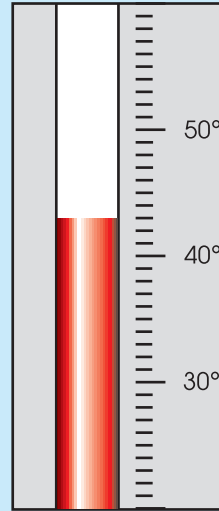
Fahrenheit (°F) is a unit for measuring temperature.

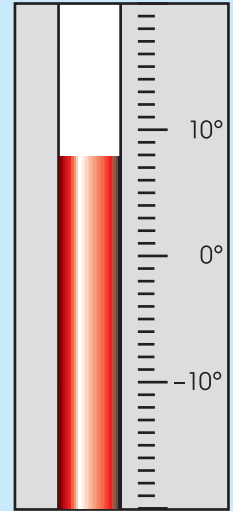
Directions: Write the temperature in degrees Fahrenheit (°F). The first one is done for you.

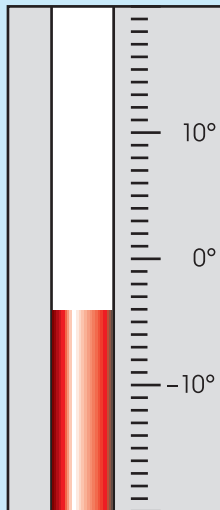


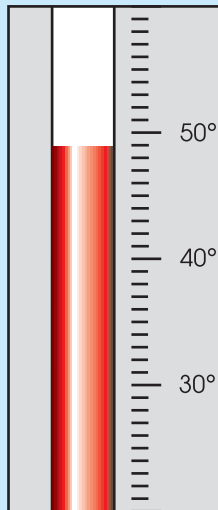
25° F

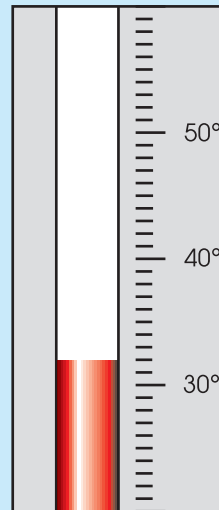


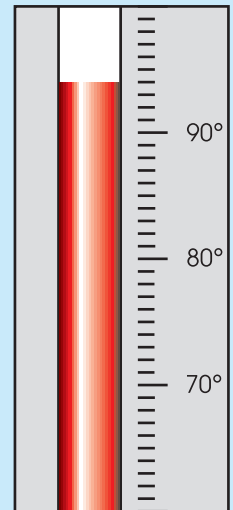








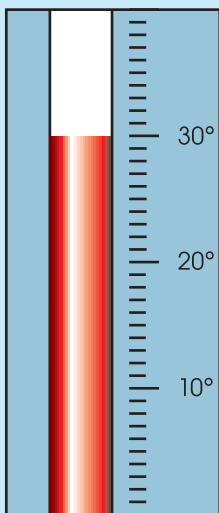




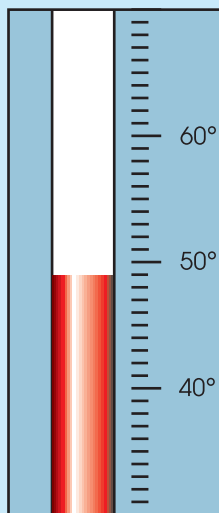
Temperature: Celsius

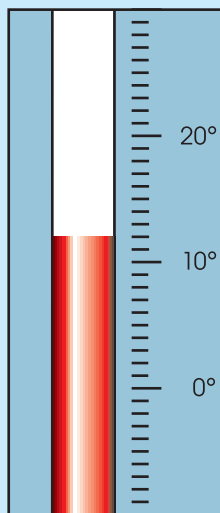
Celsius ($^{\circ}\text{C}$) is a unit for measuring temperature in the metric system.

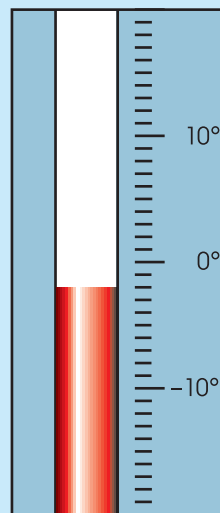
Directions: Write the temperature in degrees Celsius ($^{\circ}\text{C}$). The first one is done for you.

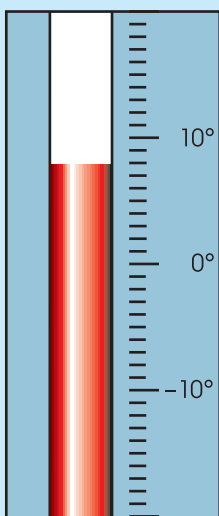


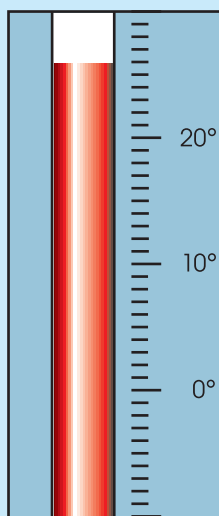
30 $^{\circ}$ C

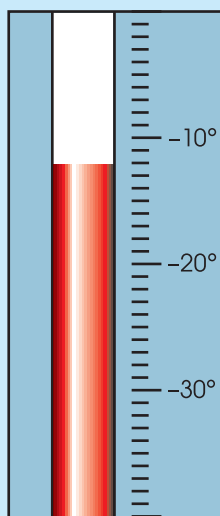


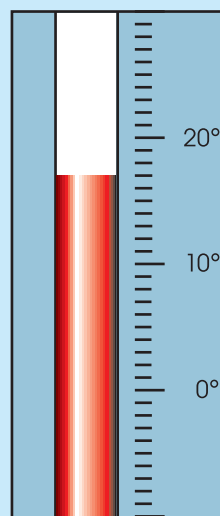












Directions: Name three common objects that are measured in metric units. Draw a picture of the object and tell what metric unit of measure is used.

Example: Bleach — 3 liters

A large, empty rectangular box with a thin black border, intended for drawing a picture of an object and writing its name and the metric unit used to measure it.A large, empty rectangular box with a thin black border, intended for drawing a picture of an object and writing its name and the metric unit used to measure it.A large, empty rectangular box with a thin black border, intended for drawing a picture of an object and writing its name and the metric unit used to measure it.

Directions: Write the best unit to measure each item: inch, foot, yard, mile, ounce, pound, ton, fluid ounce, cup, pint, quart, or gallon.

distance from New York to Chicago

weight of a goldfish

height of a building

water in a large fish tank

glass of milk

weight of a whale

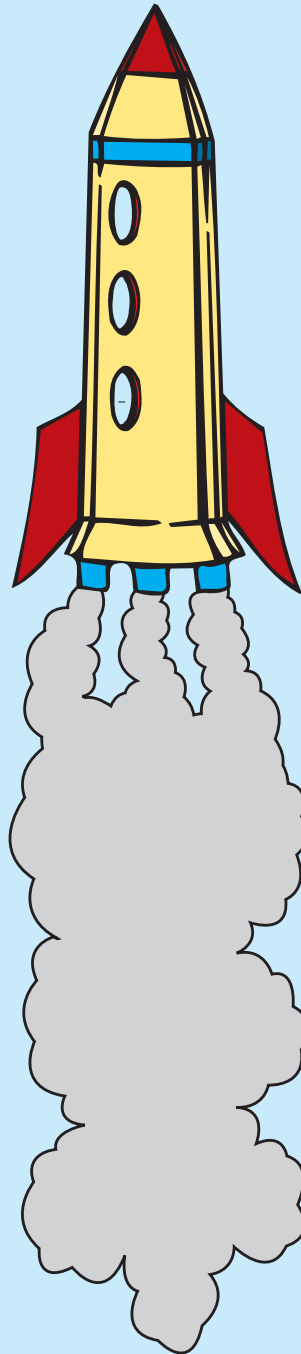
length of a pencil

distance from first base to second base

distance traveled by a space shuttle

length of a soccer field

amount of paint needed to cover a house



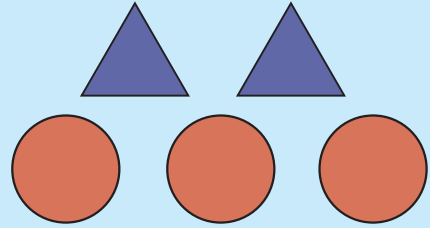
Ratio

A **ratio** is a comparison of two quantities.

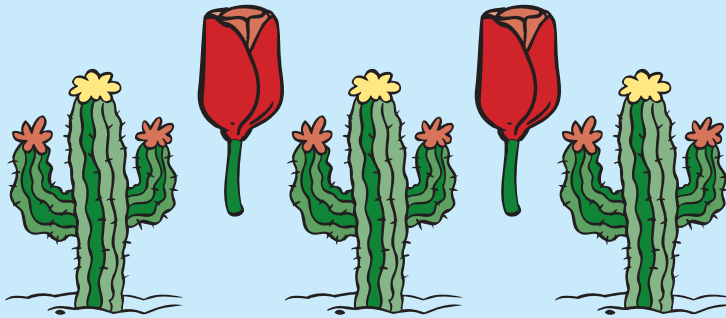
Ratios can be written three ways: 2 to 3, 2 : 3, or $\frac{2}{3}$. Each ratio is read: two to three.

Example:

The ratio of triangles to circles is 2 to 3.
The ratio of circles to triangles is 3 to 2.

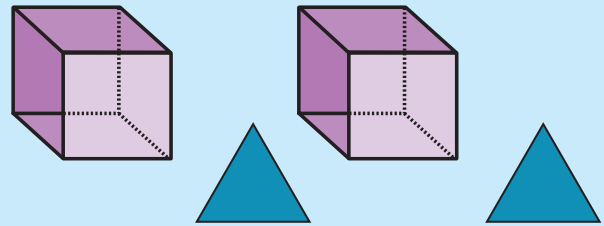


Directions: Write the ratio that compares these items.



ratio of tulips to cacti

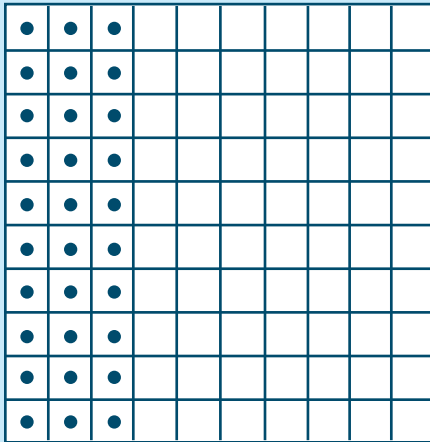
ratio of cubes to triangles



ratio of pens to pencils _____

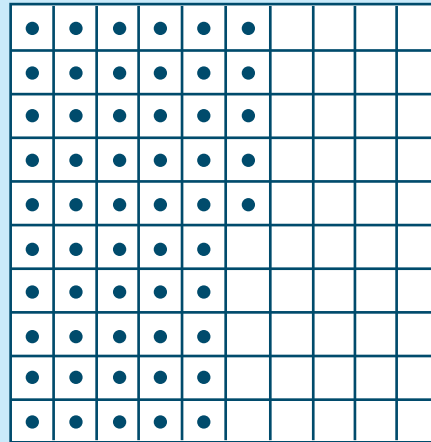
Percent is a ratio meaning “per hundred.” It is written with a % sign. 20% means 20 percent or 20 per hundred.

Example:



$$\text{ratio} = \frac{30}{100}$$

$$\text{percent} = 30\%$$



$$\text{ratio} = \frac{\quad}{\quad}$$

$$\text{percent} = \quad\%$$

Directions: Write the percent for each ratio.

$\frac{7}{100} =$	$\frac{38}{100} =$
$\frac{63}{100} =$	$\frac{3}{100} =$
$\frac{40}{100} =$	$\frac{1}{5} =$

The school received 100 books for the Book Fair. It sold 43 books. What is the percent of books sold to books received? _____



Ratio and Percent

A ratio is used to show the relationship between two things. A percent is a way of stating a ratio as compared to 100.

Animals at the Zoo			
Type of Animal	Total Number of Animals	Number of Adults	Number of Young
Reptiles	15	8	7
Elephants	6	4	2
Seals	12	8	4
Lions	7	6	1
Monkeys	45	30	15
Tropical Birds	15	12	3

Directions: Use the chart to find the ratios.

Seals to elephants _____

Adult monkeys to young monkeys _____

Lions to tropical birds _____

Mammals to reptiles _____

Young reptiles to young mammals _____

Total adults to total young _____

Directions: Use the chart to find the percents.

What percent of the zoo animals are adults? _____

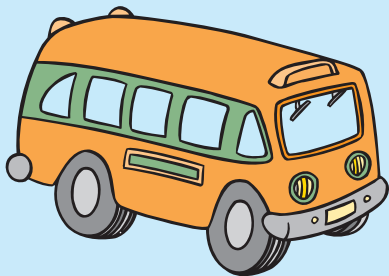
What percent of the animals have feathers? _____

What percent of the animals reproduce by laying eggs? _____

What percent of the animals are cold-blooded? _____

Probability

Probability is the ratio of favorable outcomes to possible outcomes of an experiment.



Vehicle	Number Sold
4 door	26
2 door	18
Sport	7
Van	12
Wagon	7
Compact	5
Total	75

Example:

This table records vehicle sales for 1 month. What is the probability of a person buying a van?

number of vans sold = 12 total number of cars = 75

The probability that a person will choose a van is 12 in 75 or $\frac{12}{75}$.

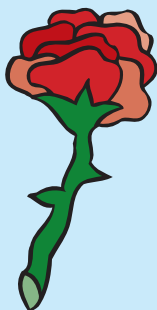
Directions: Look at the chart of flowers sold in a month. What is the probability that a person will buy each?

Roses _____

Tulips _____

Violets _____

Orchids _____



Flowers	Number Sold
Roses	48
Tulips	10
Violets	11
Orchids	7
Total	76

How would probability help a flower store owner keep the correct quantity of each flower in the store?

Calculators

A **calculator** is a machine that rapidly does addition, subtraction, multiplication, division, and other mathematical functions.

Example:

Carlos got 7 hits in 20 at bats.

$$\frac{7}{20} = \frac{35}{100} = 35\%$$

To use a calculator:

Step 1: Press 7.

Step 2: Press the \div symbol.

Step 3: Press 20.

Step 4: Press the = symbol.

Step 5: 0.35 appears.

$$0.35 = 35\%.$$



Directions: Use a calculator to find the percent of hits to the number of at bats for each baseball player. Round your answer to two digits. If your calculator displays the answer 0.753, round it to 0.75 or 75%.

Player	Hits	At Bats	Percent
Carlos	7	20	35%
Troy	3	12	_____
Sasha	4	14	_____
Dan	8	18	_____
Jaye	5	16	_____
Keesha	9	17	_____
Martin	11	16	_____

Who is most likely to get a hit? _____

Finding Percents

Find percent by dividing the number you have by the number possible.

Example:

15 out of 20 possible: $\frac{15}{20} = 0.75 = 75\%$

$$\begin{array}{r} 20 \overline{) 15.00} \\ \underline{-140} \\ 100 \\ \underline{100} \\ 0 \end{array}$$

Directions: Annie has been keeping track of the scores she earned on each spelling test during the grading period. Find out each percentage grade she earned. The first one is done for you.

Week	Number Correct	Total Number of Words	Score in Percent
1	14 (out of)	20	70%
2	16	20	_____
3	18	20	_____
4	12	15	_____
5	16	16	_____
6	17	18	_____
Review Test	51	60	_____

If Susan scored 5% higher than Annie on the review test, how many words did she get right? _____

Carrie scored 10% lower than Susan on the review test. How many words did she spell correctly? _____

Locating Points on a Grid

Coordinates help locate places on maps at the point where their imaginary lines intersect.

Directions: Write the coordinates for the location of each object. The first one is done for you.

Doll _____ 3, T _____

Cat _____

Dog _____

Bike _____

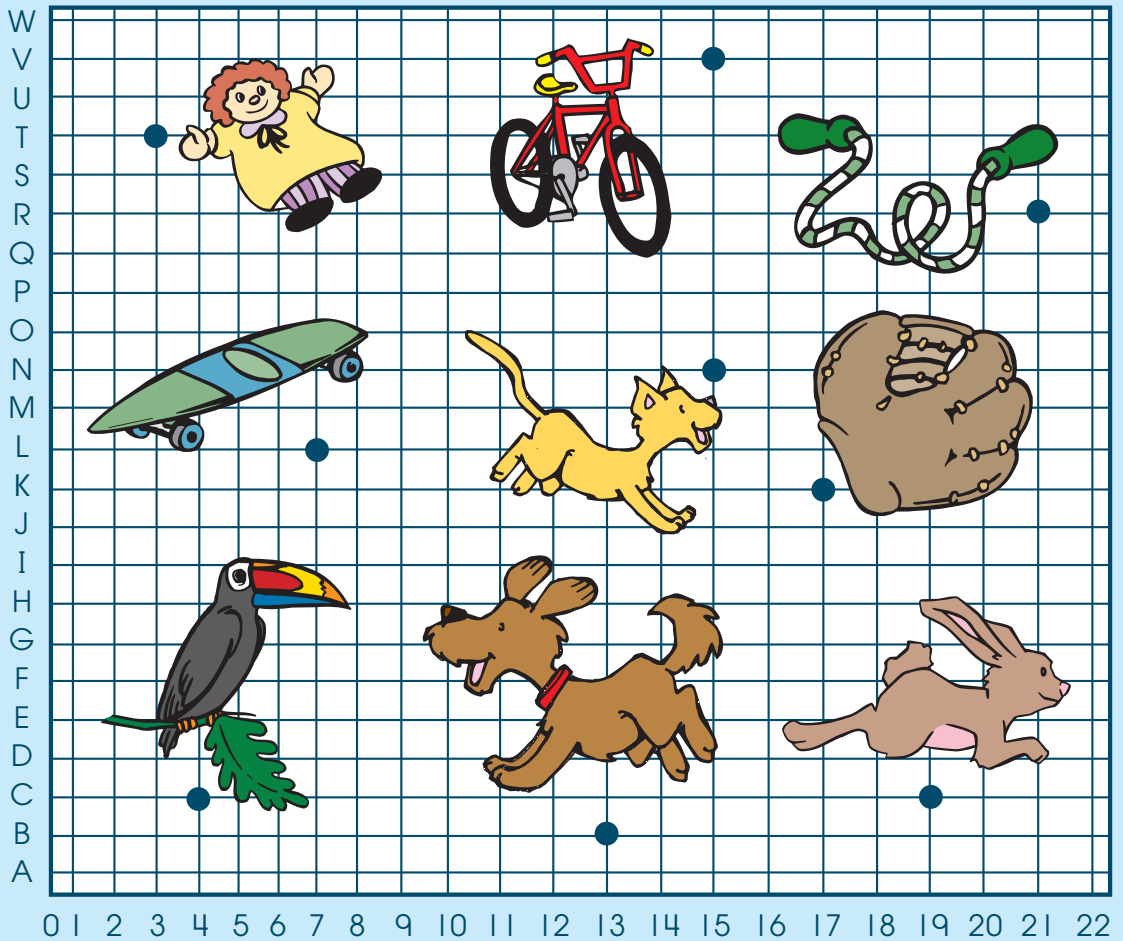
Skateboard _____

Bird _____

Jump Rope _____

Baseball Glove _____

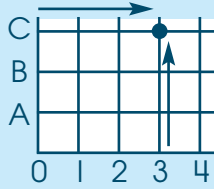
Rabbit _____



Locating Points on a Grid

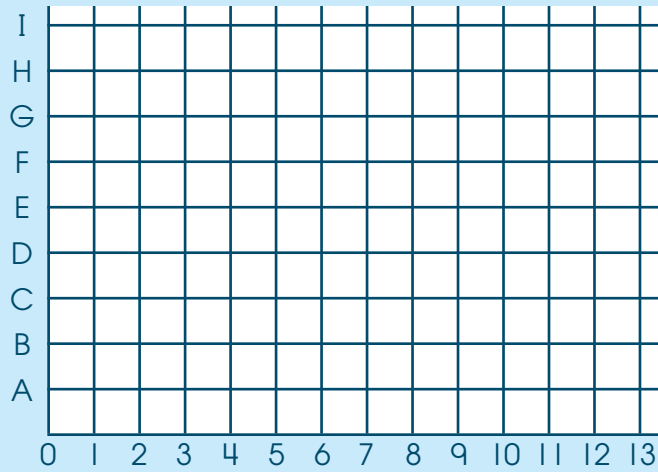
To locate points on a grid, read the first coordinate and follow it to the second coordinate.

Example: 3, C



Directions: Maya is new in town. Help her learn the way around her new neighborhood. Place the following locations on the grid below.

- Grocery 10, C
- Home 2, B
- School 12, A
- Playground 13, B
- Library 6, D
- Bank 1, G
- Post Office 7, E
- Ice-Cream Shop 3, D



Is her home closer to the bank or the grocery?

Does she pass the playground on her way to school?

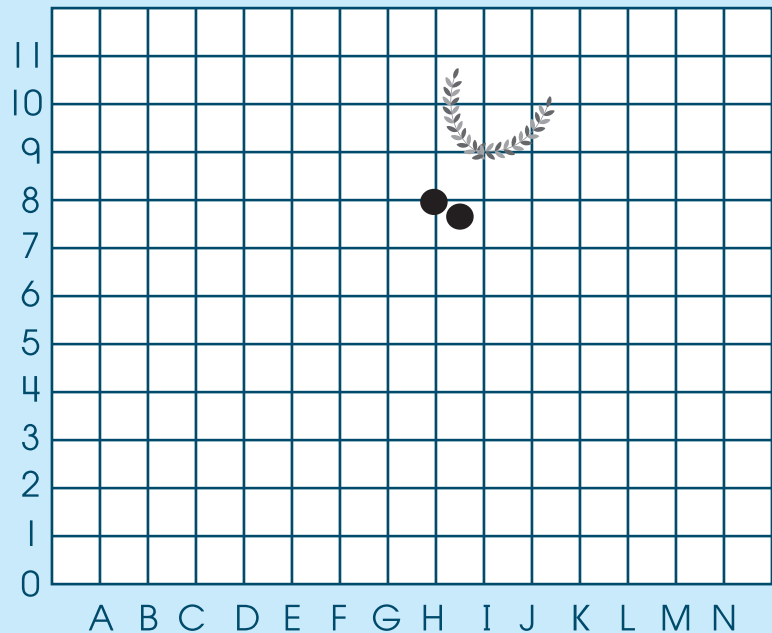
If she needs to stop at the library after school, will she be closer to home or farther away?

Locating Points on a Grid



















Directions: Draw the lines as directed from point to point for each graph.

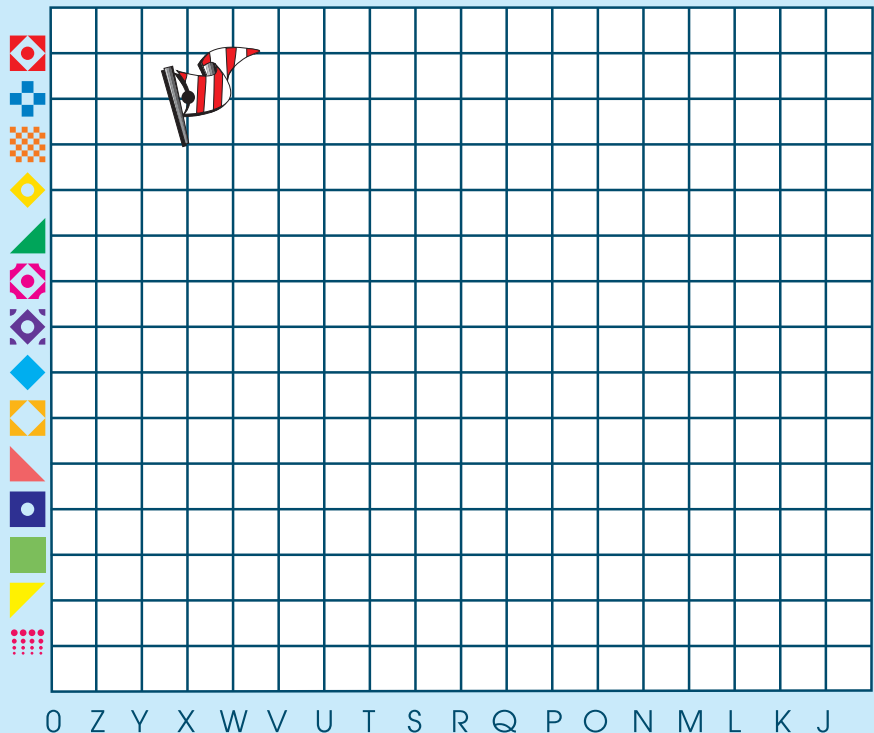
Draw a line from:

- F,7 to D,1
- D,1 to I,6
- I,6 to N,8
- N,8 to M,3
- M,3 to F,1
- F,1 to G,4
- G,4 to E,4
- E,4 to B,1
- B,1 to A,8
- A,8 to D,11
- D,11 to F,9
- F,9 to F,7
- I,9 to I,6
- I,6 to F,7
- F,7 to I,9



Draw a line from:

- J,  to N, 
- N,  to U, 
- U,  to Z, 
- Z,  to X, 
- X,  to U, 
- U,  to S, 
- S,  to N, 
- N,  to N, 
- N,  to J, 
- J, to L,
- L, to Y,
- Y, to Z,
- Z, to L,
- L, to J,

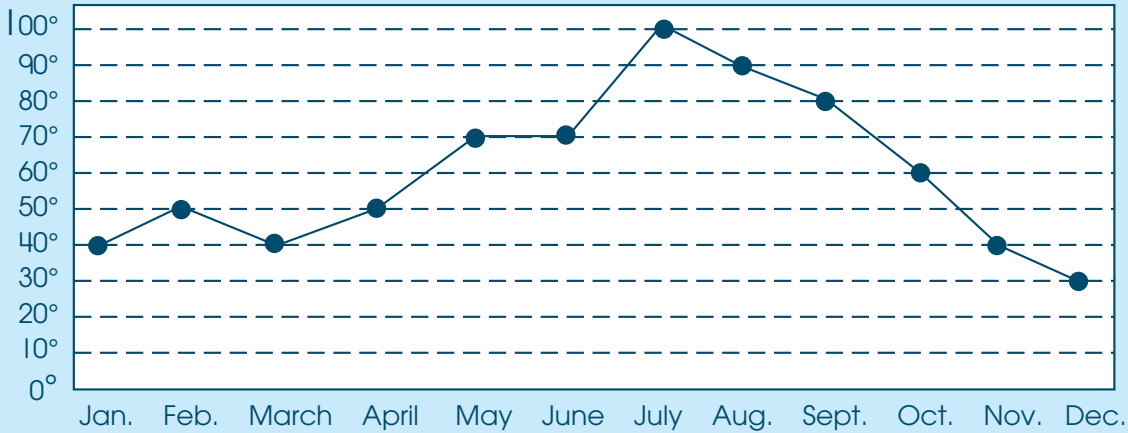


Graphs

A **graph** is a drawing that shows information about changes in numbers.

Directions: Use the graph to answer the questions.

Line Graph **Temperatures for One Year**

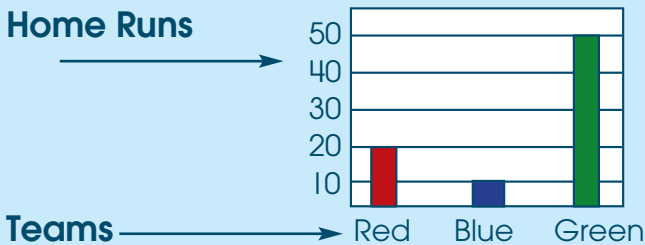


Which month was the coldest? _____

Which month was the warmest? _____

Which three months were 40 degrees? _____

Bar Graph



How many home runs did the Green team hit? _____

How many more home runs did the Green team hit than the Red team and Blue team combined? _____

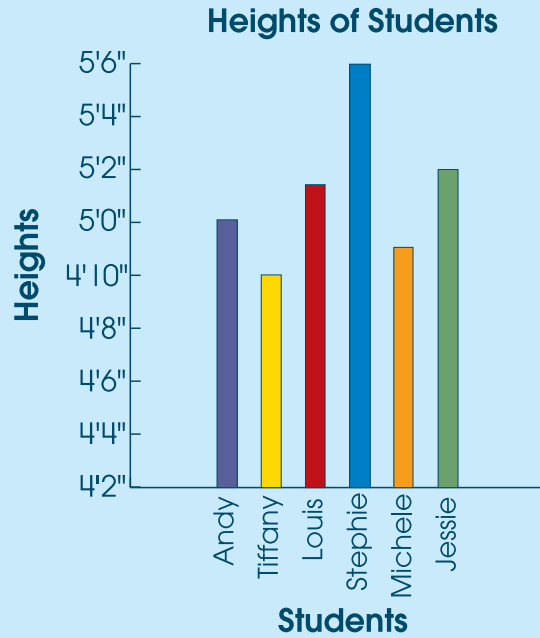


Graphs

Directions: Read each graph and follow the directions.

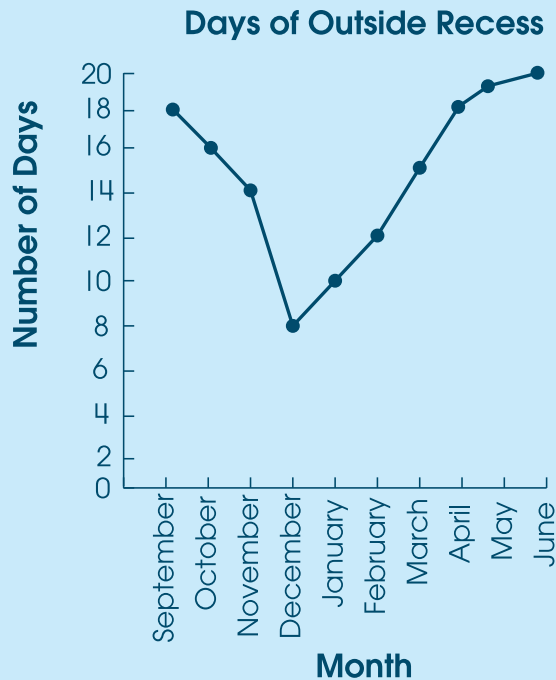
List the names of the students from the shortest to the tallest.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____



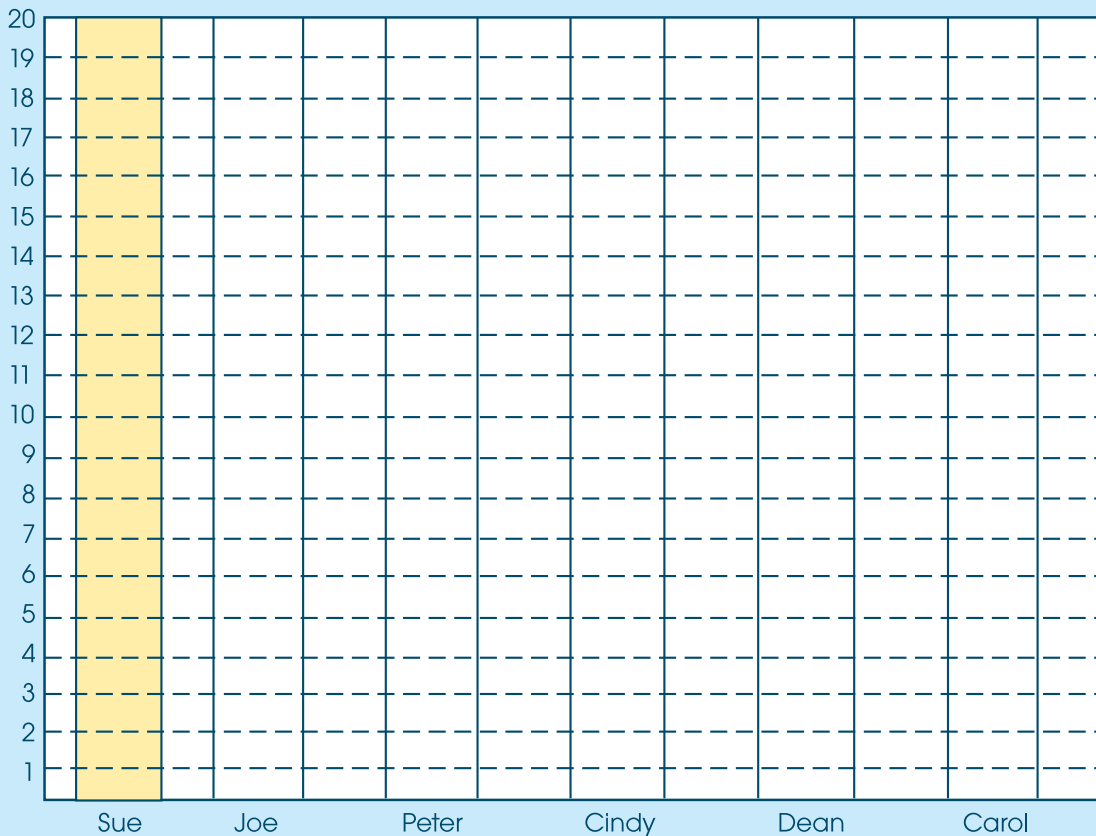
List the months in the order of the most number of outside recesses to the least number.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

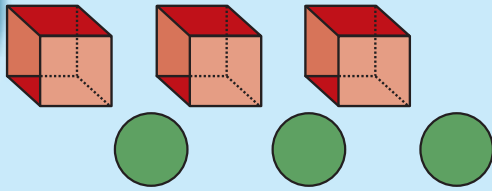


Directions: Complete the graph using the information in the table.

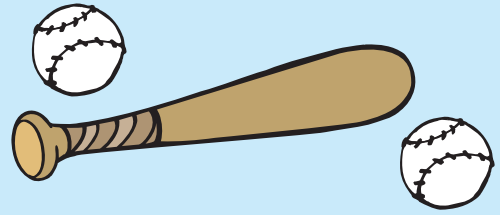
Student	Books read in February
Sue	20
Joe	8
Peter	12
Cindy	16
Dean	15
Carol	8



Directions: Write a ratio for each.



Circles to cubes _____



Baseballs to bats _____

Directions: Write each ratio as a percent.

$$\frac{73}{100} = \underline{\hspace{2cm}}$$

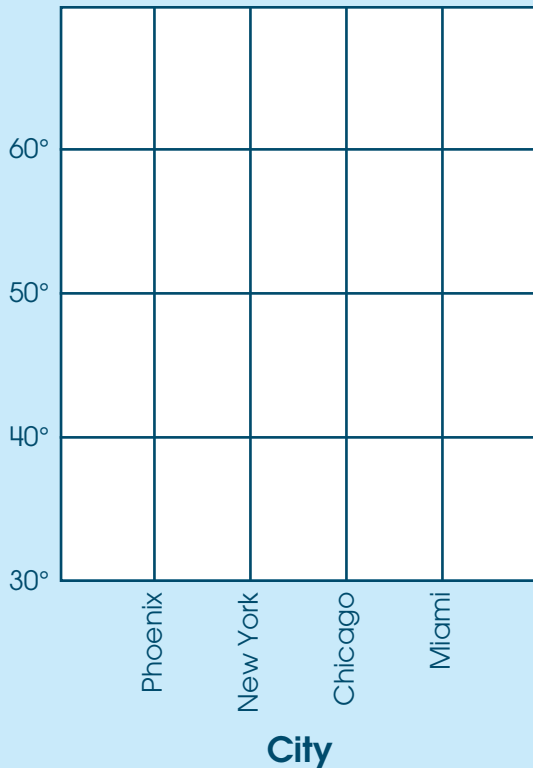
$$\frac{4}{100} = \underline{\hspace{2cm}}$$

$$\frac{1}{4} = \underline{\hspace{2cm}}$$

$$\frac{2}{5} = \underline{\hspace{2cm}}$$

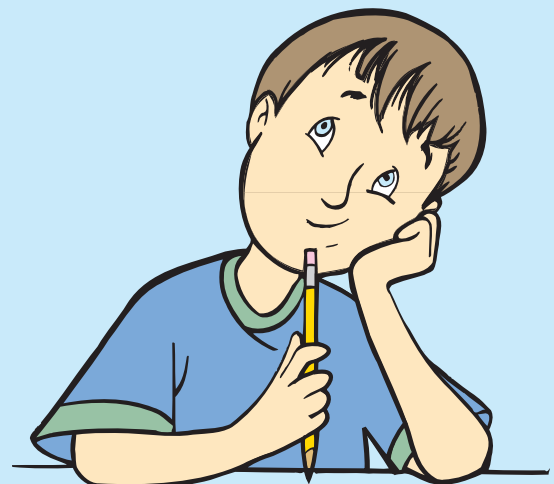
Directions: Complete the graph using the table.

Today's Temperature



Today's Temperature

City	°F
Phoenix	60°
New York	35°
Chicago	40°
Miami	60°



- Addition:** "Putting together" two or more numbers to find the sum.
- Angle:** Two rays with the same end point.
- Area:** The number of square units in a figure.
- Calculator:** A machine that rapidly does addition, subtraction, multiplication, division, and other mathematical functions.
- Celsius:** A measurement of temperature in the metric system.
- Centimeter (cm):** A metric measurement of length. There are 2.54 centimeters in an inch.
- Circumference:** The distance around a circle.
- Cone:** A space figure with one circular, flat face and one vertex.
- Congruent:** Figures with identical shapes but different orientations (facing in different directions).
- Cube:** A space figure with six square faces.
- Cup (c.):** A measurement of capacity equal to 8 fluid ounces.
- Cylinder:** A space figure with a curved surface and two parallel bases that are identical circles.
- Decimal:** A number with one or more places to the right of a decimal point, such as 6.5 or 2.25.
- Denominator:** The number below the fraction bar in a fraction.
- Diameter:** A line segment that passes through the center of a circle and has both end points on the circle.
- Dividend:** A number that is divided by another number in a division problem. In the problem $28 \div 7 = 4$, 28 is the dividend.
- Division:** The process of dividing a number into equal groups of smaller numbers.
- Divisor:** The number that is divided into the dividend in a division problem. In the problem $28 \div 7 = 4$, 7 is the divisor.
- Equation:** A number sentence.
- Estimate:** To give an approximate rather than an exact answer.
- Factors:** The numbers multiplied together to give a product.
- Fahrenheit:** A measurement of temperature in degrees.
- Foot (ft.):** A measurement of length equal to 12 inches.
- Fraction:** A number that names part of a whole. Examples: $\frac{1}{2}$ and $\frac{1}{3}$
- Gallon (gal.):** A measurement of capacity equal to 4 quarts.
- Geometry:** The branch of mathematics that has to do with points, lines, and shapes.
- Greatest Common Factor (GCF):** The largest number for a set of numbers that divides evenly into each number in the set.
- Gram (g):** A metric measurement of weight. 1,000 grams = 1 kilogram.
- Graph:** A drawing that shows information about changes in numbers.
- Improper Fraction:** A fraction in which the numerator is greater than its denominator.
- Inch:** A measurement of length. 12 inches = 1 foot.
- Kilogram (kg):** A metric measurement of weight equal to 1,000 grams.
- Kilometer (km):** A metric measurement of distance equal to 1,000 meters.
- Least Common Multiple (LCM):** The smallest number other than 0 which is a multiple of each number.
- Line:** A collection of points on a straight path that goes on and on in opposite directions.
- Liter (L):** A metric measurement of capacity equal to about 1 quart.

Meter (m): A metric measurement of length equal to 39.37 inches.

Mile (mi.): A measurement of distance equal to 1,760 yards.

Milliliter (mL): A metric measurement of capacity. 1,000 milliliters = 1 liter.

Millimeter (mm): A metric measurement of length. 10 millimeters = 1 centimeter.

Mixed Number: A number written as a whole number and a fraction.

Multiple: The product of a specific number and any other number. Example: The multiples of 2 are 2 (2×1), 4 (2×2), 6, 8, 10, 12, and so on.

Multiplication: A process of quick addition of a number a certain number of times.

Numerator: The number above the fraction bar in a fraction.

Ounce (oz.): A measurement of weight. 16 ounces = 1 pound.

Percent: A ratio which means "per hundred."

Perimeter: The distance around an object found by adding the lengths of the sides.

Pi (π): Equal to approximately 3.14.

Pint (pt.): A measurement of capacity equal to 2 cups.

Place Value: Shown by where a digit is in a number.

Pound (lb.): A measurement of weight equal to 16 ounces.

Prime Number: A positive whole number which can only be divided evenly by itself or one.

Prism: A space figure with two identical, parallel bases.

Probability: The ratio of favorable outcomes to possible outcomes of an experiment.

Product: The answer of a multiplication problem.

Pyramid: A space figure whose base is a polygon and whose faces are triangles with a common vertex—the point where two rays meet.

Quart (qt.): A measurement of capacity equal to 4 cups or 2 pints.

Quotient: The answer of a division problem.

Radius: A line segment with one end point on the circle and the other end point at the center.

Ratio: A comparison of two quantities.

Ray: A part of a line with one end point that goes on and on in one direction.

Rectangle: A figure with four corners and four sides. Sides opposite each other are the same length.

Rectangular prism: A space figure. All of the faces are rectangles.

Remainder: The number left over in the quotient of a division problem.

Rounding: To express a number to the nearest ten, hundred, thousand, and so on. Examples: round 18 up to 20; round 11 down to 10.

Segment: A part of a line having two end points.

Sphere: A space figure with no flat surface. All points are an equal distance from the center.

Square: A figure with four corners and four sides of the same length.

Subtraction: "Taking away" one number from another. Used to find the difference between two numbers.

Symmetrical: A shape that can be divided equally into two identical parts.

Ton (tn.): A measurement of weight equal to 2,000 pounds.

Triangle: A figure with three corners and three sides.

Volume: The number of cubic units inside a space figure.

Yard: A measurement of distance equal to 3 feet.

Place Value 3

The place value of a digit or numeral is shown by where it is in the number. In the number 1,234, 1 has the place value of thousands, 2 is hundreds, 3 is tens, and 4 is ones.

Example: 1,250,000,000

Read: One billion, two hundred fifty million

Write: 1,250,000,000

Billions	Millions	Thousands	Ones
h t o	h t o	h t o	h t o
1	2 5 0	0 0 0	0 0 0

Directions: Read the words. Then, write the numbers.

twenty million, three hundred four thousand 20,304,000

five thousand, four hundred twenty-three 5,423


one hundred fifty billion, eight million, one thousand, five hundred 150,008,001,500

sixty billion, seven hundred million, one hundred thousand, three hundred twelve 60,700,100,312

six hundred ninety-nine million, four thousand, nine hundred forty-two 699,004,942

Here's a game to play with a partner.

Write a 10-digit number using each digit, 0 to 9, only once. Do not show the number to your partner. Give clues like: "There is a five in the hundreds place." The clues can be given in any order. See if your partner can write the same number you have written.



Master Skills Math Grade 5

3

Place Value 4

Directions: Draw a line to connect each number to its correct written form.

- 791,000 ~~Seventeen million, five hundred thousand~~
- 17,500,000 ~~Seven hundred ninety-one thousand~~
- 3,500,000 ~~Seventy thousand, nine hundred ten~~
- 70,910 ~~Three million, five hundred thousand~~
- 35,500,000 ~~Seventeen billion, five hundred thousand~~
- 17,000,500,000 ~~Thirty-five million, five hundred thousand~~

Directions: Look carefully at this number: 2,071,943,548. Write the numeral for each of the following places.

- 6 ten thousands
- 1 millions
- 5 hundreds
- 2 billions
- 4 hundred thousands
- 7 ten millions
- 3 one thousands
- 0 hundred millions

Master Skills Math Grade 5

4

Addition 5

Addition is "putting together" two or more numbers to find the sum.

Directions: Add. Fill the backpacks with the right answers.



Master Skills Math Grade 5

5

Addition 6

Teachers of an Earth Science class planned to take 50 students on an overnight hiking and camping experience. After planning the menu, they went to the grocery store for supplies.

Breakfast	Lunch	Dinner	Snacks
bacon eggs bread cereal juice \$34.50	hot dogs/buns apples chips juice granola bars \$52.15	pasta sauce garlic bread salad cookies \$47.25	crackers marshmallows chocolate bars cocoa mix \$23.40

Directions: Answer the questions. Write the total amount spent on food for the trip.

What information do you need to answer the question? the total for each meal and snacks added together

What is the total? \$157.30

Directions: Add.

462 +574 <u>1,036</u>	918 +359 <u>1,277</u>	527 +582 <u>1,109</u>	386 +745 <u>1,131</u>	295 +764 <u>1,059</u>
1,568 +2,341 <u>3,909</u>	3,214 +2,896 <u>6,110</u>	5,147 +4,285 <u>9,432</u>	7,254 +2,451 <u>9,710</u>	9,317 +3,583 <u>12,900</u>

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6

Addition 7

Directions: Add.

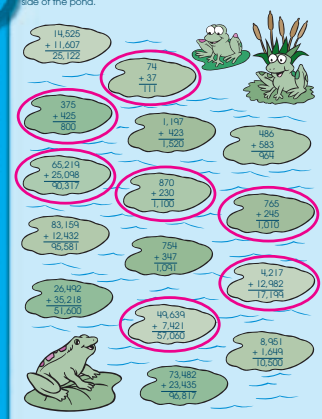
- Tourists travel to national parks to see the many animals that live there. Park Rangers estimate 384 buffalo, 282 grizzly bears, and 426 deer are in the park. What is the total number of buffalo, bears, and deer estimated in the park?
1,092 buffalo, bears, and deer
- Last August, 2,248 visitors drove motor homes into the campgrounds for overnight camping. 647 set up campsites with tents. How many campsites were there altogether in August?
2,895 campsites
- During a three-week camping trip, Tom and his family hiked 42 miles, took a 126-mile-long canoeing trip, and drove their car 853 miles. How many miles did they travel in all?
1,021 miles
- Old Faithful is a geyser which spouts water high into the air. 10,000 gallons of water burst into the air regularly. Two other geysers spout 2,400 gallons of water during each eruption. What is the amount of water thrust into the air during one cycle?
14,800 gallons
- Yellowstone National Park covers approximately 2,221,772 acres of land. Close by, the Grand Teton covers approximately 310,350 acres. How many acres of land are there in these two parks?
2,532,122 acres

Master Skills Math Grade 5

7

Addition 8

Directions: Circle the illypods with the correct answers to show the frog the correct path to follow to join their mother on the other side of the pond.



Master Skills Math Grade 5

8

Addition

Bob the butcher is popular with the dogs in town. He was making a delivery this morning when he noticed he was being followed by two dogs. Bob tried to climb a ladder to escape from the dogs. Solve the following addition problems and shade in the answers on the ladder. If all the numbers are shaded when the problems have been solved, Bob made it up the ladder. Some answers may not be on the ladder.

1. $\begin{array}{r} 986,145 \\ 621,332 \\ +203,008 \\ \hline 1,807,485 \end{array}$	2. $\begin{array}{r} 1,873,402 \\ 926,666 \\ +4,664 \\ \hline 2,803,757 \end{array}$	3. $\begin{array}{r} 506,328 \\ 886,510 \\ +342,225 \\ \hline 1,735,063 \end{array}$
4. $\begin{array}{r} 43,015 \\ 2,811,604 \\ +987,653 \\ \hline 3,841,672 \end{array}$	5. $\begin{array}{r} 18,443 \\ 300,604 \\ +998,994 \\ \hline 1,319,046 \end{array}$	6. $\begin{array}{r} 8,075 \\ 14,608 \\ +33,914 \\ \hline 56,597 \end{array}$
7. $\begin{array}{r} 9,182 \\ 7,804 \\ +755,122 \\ \hline 772,088 \end{array}$	8. $\begin{array}{r} 88,714 \\ 218,653 \\ +5,441,298 \\ \hline 5,743,665 \end{array}$	9. $\begin{array}{r} 3,248,662 \\ 1,984,114 \\ +521,387 \\ \hline 5,752,163 \end{array}$
10. $\begin{array}{r} 4,581 \\ 22,983 \\ +5,618,775 \\ \hline 5,646,339 \end{array}$	11. $\begin{array}{r} 818,623 \\ 926 \\ +3,260,004 \\ \hline 4,079,553 \end{array}$	12. $\begin{array}{r} 80,436 \\ 9,159 \\ +3,028,761 \\ \hline 3,118,356 \end{array}$

Does Bob make it? no

Master Skills Math Grade 5

9

Subtraction

Subtraction is "taking away" one number from another to find the difference between the two numbers.

Directions: Subtract.

$\begin{array}{r} 76 \\ -23 \\ \hline 53 \end{array}$	$\begin{array}{r} 93 \\ -14 \\ \hline 79 \end{array}$	$\begin{array}{r} 68 \\ -25 \\ \hline 43 \end{array}$	$\begin{array}{r} 44 \\ -17 \\ \hline 27 \end{array}$	$\begin{array}{r} 88 \\ -34 \\ \hline 54 \end{array}$	$\begin{array}{r} 54 \\ -26 \\ \hline 28 \end{array}$
---	---	---	---	---	---

Brent saved \$75.00 of the money he earned delivering the local newspaper in his neighborhood. He wanted to buy a new bicycle that cost \$134.00. How much more would he need to save in order to buy the bike?

\$64.00

When Brent finally went to buy the bicycle, he saw a light and basket for the bike. He decided to buy them both. The light was \$5.95 and the basket was \$10.50. He gave the clerk a twenty dollar bill but his grandmother had given him for his birthday. How much change did he get back?

\$3.55

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10

Subtraction

When working with larger numbers, it is important to keep the numbers lined up according to place value.

Directions: Subtract.

$\begin{array}{r} 398 \\ -194 \\ \hline 204 \end{array}$	$\begin{array}{r} 543 \\ -287 \\ \hline 256 \end{array}$	$\begin{array}{r} 491 \\ -311 \\ \hline 180 \end{array}$
$\begin{array}{r} 8,391 \\ -5,492 \\ \hline 2,899 \end{array}$	$\begin{array}{r} 63,852 \\ -34,765 \\ \hline 29,087 \end{array}$	$\begin{array}{r} 24,107 \\ -19,350 \\ \hline 4,757 \end{array}$

Eagle Peak is the highest mountain peak at Yellowstone National Park. It is 11,110 feet high. The next highest point at the park is Mount Washburn. It is 10,243 feet tall. How much higher is Eagle Peak?

1,110 feet

The highest mountain peak in North America is Mount McKinley, which stretches 20,320 feet toward the sky. Two other mountain ranges in North America have peaks at 10,302 feet and 8,194 feet. What is the greatest difference between the peaks?

12,126 feet

Master Skills Math Grade 5

11

Checking Subtraction

You can check your subtraction by using addition.

Example: $\begin{array}{r} 34,435 \\ -22,172 \\ \hline 12,263 \end{array}$ Check: $\begin{array}{r} 12,263 \\ +22,172 \\ \hline 34,435 \end{array}$

Directions: Subtract. Then, check your answers by adding.

$\begin{array}{r} 15,326 \\ -11,532 \\ \hline 3,794 \end{array}$ Check: $\begin{array}{r} 3,794 \\ +11,532 \\ \hline 15,326 \end{array}$	$\begin{array}{r} 28,615 \\ -26,394 \\ \hline 2,221 \end{array}$ Check: $\begin{array}{r} 2,221 \\ +26,394 \\ \hline 28,615 \end{array}$
$\begin{array}{r} 96,521 \\ -47,378 \\ \hline 49,143 \end{array}$ Check: $\begin{array}{r} 49,143 \\ +47,378 \\ \hline 96,521 \end{array}$	$\begin{array}{r} 46,496 \\ -10,619 \\ \hline 35,877 \end{array}$ Check: $\begin{array}{r} 10,619 \\ +35,877 \\ \hline 46,496 \end{array}$
$\begin{array}{r} 77,911 \\ -63,789 \\ \hline 14,122 \end{array}$ Check: $\begin{array}{r} 14,122 \\ +63,789 \\ \hline 77,911 \end{array}$	$\begin{array}{r} 156,901 \\ -112,732 \\ \hline 44,169 \end{array}$ Check: $\begin{array}{r} 44,169 \\ +112,732 \\ \hline 156,901 \end{array}$
$\begin{array}{r} 396,638 \\ -187,564 \\ \hline 209,074 \end{array}$ Check: $\begin{array}{r} 209,074 \\ +187,564 \\ \hline 396,638 \end{array}$	$\begin{array}{r} 67,002 \\ -53,196 \\ \hline 13,806 \end{array}$ Check: $\begin{array}{r} 13,807 \\ +53,195 \\ \hline 67,002 \end{array}$
$\begin{array}{r} 16,075 \\ -15,898 \\ \hline 177 \end{array}$ Check: $\begin{array}{r} 179 \\ +15,896 \\ \hline 16,075 \end{array}$	$\begin{array}{r} 34,678 \\ -14,769 \\ \hline 19,909 \end{array}$ Check: $\begin{array}{r} 19,909 \\ +14,769 \\ \hline 34,678 \end{array}$

During the summer, 158,941 people visited Yellowstone National Park. During the fall, there were 52,347 visitors. How many more visitors went to the park during the summer than the fall?

106,544 visitors

Master Skills Math Grade 5

12

Addition and Subtraction

Directions: Check the answers. Write T if the answer is true and F if it is false. The first one is done for you.

Example: $\begin{array}{r} 48,973 \\ -35,856 \\ \hline 13,118 \end{array}$ Check: $\begin{array}{r} 35,856 \\ +13,118 \\ \hline 48,974 \end{array}$ F

$\begin{array}{r} 18,264 \\ +17,893 \\ \hline 36,157 \end{array}$ Check: <u>T</u>	$\begin{array}{r} 458,342 \\ -297,652 \\ \hline 160,690 \end{array}$ Check: <u>F</u>	$\begin{array}{r} 160,680 \\ +247,652 \\ \hline 408,332 \end{array}$ Check: <u>F</u>
$\begin{array}{r} 39,854 \\ +52,713 \\ \hline 92,567 \end{array}$ Check: <u>F</u>	$\begin{array}{r} 631,928 \\ -457,615 \\ \hline 174,313 \end{array}$ Check: <u>T</u>	$\begin{array}{r} 174,313 \\ +631,928 \\ \hline 806,241 \end{array}$ Check: <u>F</u>
$\begin{array}{r} 14,389 \\ +93,587 \\ \hline 107,976 \end{array}$ Check: <u>T</u>	$\begin{array}{r} 554,974 \\ -376,585 \\ \hline 178,389 \end{array}$ Check: <u>T</u>	$\begin{array}{r} 178,389 \\ +376,585 \\ \hline 554,974 \end{array}$ Check: <u>T</u>

Directions: Read the story problem. Write the equation and check the answer.

A camper hikes 53,741 feet out into the wilderness. On his return trip he takes a shortcut, walking 36,752 feet back to his cabin. The shortcut saves him 16,989 feet of hiking. True or False?

$53,741$	$16,998$
$-36,752$	$+36,752$
$16,989$	$53,750$

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13

Addition and Subtraction

Directions: Add or subtract to find the answers.

Eastland School hosted a field day. Students could sign up for a variety of events. 175 students signed up for individual races, 20 two-person teams competed in the mile relay, and 36 kids took part in the high jump. How many students participated in the activities?

251 students

Westmore School brought 42 students and 7 adults to the field day event. Northern School brought 84 students and 15 adults. There was a total of 300 students and 45 adults at the event. How many were from other schools?

174 students 23 adults

The Booster Club sponsored a concession stand during the day. Last year, they made \$1,000 at the same event. This year, they hoped to earn at least \$1,250. They actually raised \$1,842. How much more did they make than they had anticipated?

\$592.00

The Booster Club decided to spend \$1,000 to purchase several items for the school with the money they had earned. Study the list of items suggested and decide which combination of items they could purchase.

A. Swing set	\$425	<u>A+B+D</u>
B. Skiing board	\$263	<u>B+C+D</u>
C. Scoreboard	\$515	<u>A+C</u>
D. Team uniforms	\$180	

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Answer Key



Addition

15

When adding many numbers together, be sure to keep them lined up according to their place value.

Directions: Add. Use a calculator to check your answers.

408,107	75,310	708,302	6,700,241
31,641	89,632	40,927	9,334,300
9,111	1,942	20,085	3,017
400	736	943	4,322,119
+ 296	+ 922	+ 589	+ 7,384
449,554	168,142	770,246	20,367,061

215,106	3,892,442	5,312,612	8,700,370
69,015	318,712	680,325	804,304
5,446	76,698	46,669	17,009
621	7,361	7,360	7,919
+ 306	+ 567	+ 812	+ 250
290,494	4,295,780	6,047,768	9,529,852

954,432	6,935	12,897
126,243	12,897	64,382
27,591	69,473	29,318
8,900	43,190	13,269
+ 27	+ 48,579	+ 4,769
1,117,213	181,074	124,635

15

Rounding

16

Rounding a number means to express it to the nearest ten, hundred, thousand, and so on. When rounding a number to the nearest ten, if the number has five or more ones, round up. Round down if the number has four or fewer ones.

Examples:

Round to the nearest **ten**: 84 → **80** 86 → **90**
 Round to the nearest **hundred**: 187 → **200** 120 → **100**
 Round to the nearest **thousand**: 981 → **1,000** 5,480 → **5,000**

Directions: Round these numbers to the nearest **ten**.
 87 → **90** 53 → **50** 48 → **50** 32 → **30**

Directions: Round these numbers to the nearest **hundred**.
 168 → **200** 243 → **200** 591 → **600** 743 → **700**

Directions: Round these numbers to the nearest **thousand**.
 895 → **1,000** 3,492 → **3,000**
 7,521 → **8,000** 14,901 → **15,000**

City	Population
Cleveland	492,801
Seattle	520,947
Omaha	345,033
Kansas City	443,878
Atlanta	396,052
Austin	514,013

Directions: Use the city population chart to answer the questions.

Which cities have a population of about 500,000?
Cleveland, Seattle, Austin

Which city has a population of about 350,000?
Omaha

How many cities have a population of about 400,000?
two

16

Estimating

17

To **estimate** means to give an approximate rather than an exact answer. Rounding each number first makes it easy to estimate an answer.

Example:

93 → 90	321 → 300	1,859 → 2,000
+ 48 → +50	+ 547 → +600	- 997 → -1,000
= 140	= 900	= 1,000

Directions: Estimate the sums and differences by rounding the numbers first.

68 → 70	12 → 10	271 → 300
+ 34 → +30	+ 98 → +100	- 126 → -100
= 100	= 110	= 200

1,532 → 2,000	8,312 → 8,000	6,341 → 6,000
- 998 → -1,000	- 4,784 → -5,000	+ 9,286 → +9,000
= 1,000	= 3,000	= 15,000

Bonnie has \$50 to purchase tennis shoes, a tennis racket, and tennis balls. Does she have enough money?
yes

17

Rounding and Estimating

18

Rounding numbers and estimating answers is an easy way of finding the approximate answer without writing out the problem or using a calculator.

Directions: Circle the correct answer.

Round to the nearest **ten**:
 73 → **70** 48 → **50** 65 → **70**

Round to the nearest **hundred**:
 139 → **100** 782 → **800** 390 → **400**

Round to the nearest **thousand**:
 1,375 → **1,000** 21,800 → **22,000** 36,240 → **36,000**

Sam wanted to buy a new computer. He knew he only had about \$1,200 to spend. Which of the following ones could he afford to buy?

\$1,195	\$1,279	\$1,249

If Sam spent \$39 on software for his new computer, \$265 for a printer, and \$38 for a cordless mouse, about how much money did he need?
\$40 + \$300 + \$40 = \$380.00

18

Review

19

Directions: Add.

1. 45 + 50 = 95	5. 72 + 28 = 100
2. 63 + 37 = 100	6. 56 + 16 = 72
3. 25 + 60 = 85	7. 90 + 43 = 133
4. 55 + 55 = 110	8. 63 + 73 = 136

Anne ordered these items for breakfast at her favorite restaurant:

- scrambled eggs
- toast
- orange juice
- bacon strips

How much did she spend? **\$7.10**

Anne paid for her breakfast with a 10-dollar bill. How much change should she get back?
\$2.90

Specials

Eggs \$2.50

Bacon \$2.15

Toast \$1.20

Juice \$1.25

Directions: Subtract.

9. 95 - 30 = 65	13. 49 - 10 = 39
10. 125 - 50 = 75	14. 78 - 30 = 48
11. 67 - 20 = 47	15. 150 - 65 = 85
12. 140 - 80 = 60	16. 185 - 90 = 95

19

Review

20

Directions: Add.

256	8,968	28,493	168,573
+ 538	+ 3,481	+ 38,975	+ 257,899
794	12,449	67,468	426,472

Directions: Subtract.

189,453	1,350,681	856,721	29,051
- 98,794	- 467,792	- 650,853	- 15,160
90,659	882,889	205,868	13,891

Directions: Draw a line to the number that has:

five ten millions	1,950,783
six hundreds	45,640
nine hundred thousands	1,453,682,073

Directions: Round to the nearest:

ten	83 → 80	77 → 80
hundred	4,848 → 4,800	8,501 → 8,500
thousand	2,920 → 3,000	179,642 → 180,000
million	1,891,403 → 2,000,000	3,499,999 → 3,000,000

Directions: Estimate the sums and differences by rounding.

582 → 600	7,961 → 8,000	6,891 → 7,000	17,988 → 18,000
+ 175 → 200	- 1,241 → 1,000	+ 578 → 600	- 5,794 → 6,000
800	7,000	8,000	12,000

20

Prime Numbers

21

A prime number cannot be divided evenly by any number. A prime number is always greater than 1.

Example:
3 is a prime number.
 $3 \div 1 = 3$ and $3 \div 3 = 1$

Any other divisor will result in a mixed number or fraction.

Example:
11 can only be divided by 1 and 11. It is a prime number.

Directions: Write the first 15 prime numbers.

Prime Numbers:

2 3 5 7 11
13 17 19 23 29
31 37 41 43 47

How many prime numbers are there between 0 and 100? 25

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21

Prime Numbers

22

Directions: Circle the prime numbers.

71	3	82	20	43	69
128	47	93	111	75	51
18	44	37	68	171	83
61	21	77	101	34	16
2	39	92	17	52	29
19	156	63	99	27	147
121	25	88	12	87	55
57	7	139	91	9	37
67	183	5	59	11	95

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22

Multiples

23

A multiple is the product of a specific number and any other number. When you multiply two numbers, the answer is called the product.

Example:
The multiples of 2 are 2 (2×1), 4 (2×2), 6, 8, 10, 12, and so on.

The **least common multiple (LCM)** of two or more numbers is the smallest number other than 0 that is a multiple of each number.

Example:
Multiples of 3 are 3, 6, 9, 12, 15, 18, 21, 24, etc.
Multiples of 4 are 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, etc.
The multiples that 3 and 4 have in common are 12, 24, 36, 48, etc.
The LCM of 3 and 4 is 12.

Directions: Write the first nine multiples of 3, 4, and 6. Write the LCM.

3: 3, 6, 9, 12, 15, 18, 21, 24, 27
 4: 4, 8, 12, 16, 20, 24, 28, 32, 36
 6: 6, 12, 18, 24, 30, 36, 42, 48, 54

LCM = 12

Directions: Write the first nine multiples of 2 and 5. Write the LCM.

2: 2, 4, 6, 8, 10, 12, 14, 16, 18
 5: 5, 10, 15, 20, 25, 30, 35, 40, 45

LCM = 10

Directions: Find the LCM for each pair of numbers.
7 and 3: 21 4 and 6: 12 6 and 9: 18

Directions: Fill in the missing numbers.
30 has multiples of 5 and 6, of 2 and 15, of 3 and 10.

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23

Factors

24

Factors are the numbers multiplied together to give a product. The **greatest common factor (GCF)** is the largest number for a set of numbers that divides evenly into each number in the set.

Example:
The factors of 12 are 3×4 , 2×6 , and 1×12 .
We can write the factors like this:
3, 4, 2, 6, 12, 1.
The factors of 8 are 2, 4, 8, 1.
The common factors of 12 and 8 are 2 and 4 and 1.
The GCF of 12 and 8 is 4.

Directions: Write the factors of each pair of numbers. Then, write the common factors and the GCF.

12: 1, 2, 3, 4, 6, 12
 15: 1, 3, 5, 15

The common factors of 12 and 15 are 1, 3.
The GCF is 3.

20: 1, 2, 4, 5, 10, 20
 10: 1, 2, 5, 10

The common factors of 10 and 20 are 1, 2, 5, 10.
The GCF is 10.

Directions: Write the GCF for the following pairs of numbers.
28 and 20: 4 42 and 12: 6
 36 and 12: 12 20 and 5: 5

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Factor Trees

25

A **factor tree** shows the prime factors of a number. A prime number, such as 7, has for its factors only itself and 1.

Example:
 $30 = 3 \times 2 \times 5$
 3, 2, and 5 are prime numbers.

Directions: Fill in the numbers in the factor trees.

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Factor Trees

26

Directions: Fill in the numbers in the factor trees. The first one is done for you.

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26

Greatest Common Factor

27

Directions: Write the greatest common factor for each set of numbers.

10 and 35 5
 2 and 10 2
 42 and 63 21
 16 and 40 8
 25 and 55 5
 12 and 20 4
 14 and 28 14
 8 and 20 4
 6 and 27 3
 15 and 35 5
 18 and 48 6

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27

Least Common Multiple

28

Directions: Write the least common multiple for each pair of numbers.

12 and 7 84
 2 and 4 4
 22 and 4 44
 6 and 10 30
 3 and 7 21
 6 and 8 24
 5 and 10 10
 8 and 12 24
 9 and 15 45
 7 and 5 35
 3 and 8 24
 9 and 4 36

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28

Multiplication

29

Multiplication is a process of quick addition of a number a certain number of times.

Example: $3 \times 15 = 45$ is the same as adding 15 three times.

Directions: Multiply.

$32 \times 3 = 96$, $48 \times 7 = 336$, $26 \times 5 = 130$, $19 \times 6 = 114$, $63 \times 2 = 126$

$251 \times 4 = 1,004$, $528 \times 8 = 4,184$, $915 \times 3 = 2,745$, $481 \times 7 = 3,017$, $275 \times 3 = 825$

$412 \times 21 = 8,652$, $643 \times 17 = 10,931$, $526 \times 22 = 11,572$, $742 \times 35 = 25,970$

Cathy is on the cross country team. She runs 3 miles every day except on her birthday. How many miles does she run each year?
1,092 miles

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Multiplication

30

Directions: Multiply.

Josh decided to join a book club. He received a new book every 2 weeks. He read 40 pages every night during the first 2 weeks in order to finish one book. How many pages did he read?
560 pages

During the summer, he received 10 books in all. He read a total of 2,600 pages that summer. He read 65 pages each day that he read. How many days did it take him to read all 10 books?
40 days

The book company offered him a special deal. He could purchase five books for \$49.00. He decided to buy 25 books at this special price. How much money did he need to send with his order?
\$245.00

At the end of the year, Josh decided to share his books with a friend. His friend offered to pay him \$3.00 for each book, but he only had \$85.00 to spend. How many books could he buy?
28 books

$247 \times 15 = 3,705$, $483 \times 72 = 34,776$, $826 \times 43 = 35,518$, $394 \times 58 = 20,822$, $735 \times 21 = 15,435$

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30

Multiplication

31

Be certain to keep the proper place value when multiplying by tens and hundreds.

Example:

$143 \times 250 = 35,750$, $250 \times 100 = 25,000$, $858 \times 1250 = 1,072,500$, $286 \times 250 = 71,500$

Directions: Multiply.

$701 \times 308 = 215,908$, $621 \times 538 = 334,098$, $348 \times 200 = 69,600$

$537 \times 189 = 101,493$, $416 \times 727 = 302,432$, $682 \times 472 = 321,904$

$878 \times 638 = 560,164$, $267 \times 196 = 52,332$, $893 \times 214 = 191,102$

An airplane flies 720 trips a year between the cities of Chicago and Columbus. Each trip is 375 miles. How many miles does the airplane fly each year?
270,000

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31

Division

32

Division is the reverse of multiplication. It is the process of dividing a number into equal groups of smaller numbers.

Directions: Divide.

Greg had 936 marbles to share with his two brothers. If the boys divided them evenly, how many will each one get?
312 marbles

The marbles Greg kept were four different colors: blue, green, red, and orange. He had the same number of each color. He divided them into two groups. One group had only orange marbles. The rest of the marbles were in the other group. How many marbles did he have in each group? orange 78 others 234

The **dividend** is the number to be divided by another number. In the problem $28 \div 7 = 4$, 28 is the dividend.

The **divisor** is the number by which another number is divided. In the problem $28 \div 7 = 4$, 7 is the divisor.

The **quotient** is the answer in a division problem. In the problem $28 \div 7 = 4$, 4 is the quotient.

The **remainder** is the number left over in the quotient of a division problem. In the problem $29 \div 7 = 4r1$, 1 is the remainder.

Directions: Write the answers.

In the problem $25 \div 8 = 3r1$...

What is the divisor? 8 What is the remainder? 1

What is the quotient? 3r1 What is the dividend? 25


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32

Division 33

When dividing with remainders, the remainder must always be less than the divisor.

Example:
$$\begin{array}{r} 241 \overline{) 2616} \\ \underline{52} \\ 107 \\ \underline{104} \\ 30 \\ \underline{24} \\ 6 \end{array}$$



Directions: Divide.

$23 \overline{) 231}$	$41 \overline{) 411}$	$75 \overline{) 7545}$
$53 \overline{) 1,220}$	$37 \overline{) 1,528}$	$83 \overline{) 6,270}$

$27 \overline{) 11}$	$91 \overline{) 6}$	$133 \overline{) 30}$
$14 \overline{) 389}$	$29 \overline{) 2,645}$	$60 \overline{) 8,010}$

$72 \overline{) 26}$	$11 \overline{) 19}$	$55 \overline{) 43}$
$35 \overline{) 2,946}$	$43 \overline{) 492}$	$83 \overline{) 4,608}$

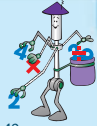
The Oregon Trail is 2,147 miles long. How long would it take a covered wagon traveling 20 miles a day to complete the trip?
110 days

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Equations 35

An **equation** is a number sentence. To solve an equation, always work from left to right unless numbers are in parentheses.

Directions: Write the answers to these equations. The first one is done for you.



$3 \times 2 + 4 + 9 = 19$

$4 \times 2 \times 8 + 4 \times 2 = 32$

$9 + 3 \times 5 \times 5 \times 2 = 150$

$7 \times 4 \times 3 + 12 \times 8 = 56$

$20 \times 3 + 6 \times 4 + 5 = 8$

$32 + 8 \times 4 \times 4 + 2 = 32$

$52 \times 5 \times 2 + 5 \times 7 = 728$

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Review 37

Directions: Write the LCM of each pair of numbers.

5 and 6 **30** 2 and 6 **6**
7 and 4 **28** 4 and 8 **8**

Directions: Write the GCF of each pair of numbers.

12 and 9 **3** 18 and 9 **9**
5 and 15 **5** 32 and 8 **8**



Directions: Multiply.

$\begin{array}{r} 856 \\ \times 323 \\ \hline \end{array}$	$\begin{array}{r} 537 \\ \times 248 \\ \hline \end{array}$	$\begin{array}{r} 916 \\ \times 35 \\ \hline \end{array}$	$\begin{array}{r} 7,328 \\ \times 468 \\ \hline \end{array}$
--	--	---	--

275,044 133,176 32,060 3,429,504

Directions: Divide and check your answers.


$27 \overline{) 8,236}$ Check: $\begin{array}{r} 305 \\ \times 27 \\ \hline 8,235 \\ + 1 \\ \hline 8,236 \end{array}$	$43 \overline{) 27,945}$ Check: $\begin{array}{r} 300 \\ \times 93 \\ \hline 27,900 \\ + 45 \\ \hline 27,945 \end{array}$
---	---

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34 Checking Division

Answers in division problems can be checked by multiplying.

Example:
$$\begin{array}{r} 88 \overline{) 15,840} \\ \underline{132} \\ 264 \\ \underline{204} \\ 50 \\ \underline{33} \\ 17 \end{array}$$



Directions: Divide and check your answers.

$61 \overline{) 2,736}$ Check: $\begin{array}{r} 44 \\ \times 61 \\ \hline 2,684 \\ + 52 \\ \hline 2,736 \end{array}$	$73 \overline{) 86,143}$ Check: $\begin{array}{r} 1,180 \\ \times 73 \\ \hline 86,140 \\ + 3 \\ \hline 86,143 \end{array}$
$54 \overline{) 9,390}$ Check: $\begin{array}{r} 159 \\ \times 59 \\ \hline 9,381 \\ + 9 \\ \hline 9,390 \end{array}$	$43 \overline{) 77,141}$ Check: $\begin{array}{r} 1,793 \\ \times 43 \\ \hline 77,099 \\ + 42 \\ \hline 77,141 \end{array}$

Denny has a baseball card collection. He has 13,789 cards. He wants to put the cards in a scrapbook that holds 15 cards on a page. How many pages does Denny need in his scrapbook?
920 pages

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36 Multiplication and Division

Directions: Multiply or divide to find the answers.

Brianna's summer job is mowing lawns for three of her neighbors. Each lawn takes about one hour to mow and needs to be done once every week. At the end of the summer, she will have earned a total of \$630. She collected the same amount of money from each job. How much did each neighbor pay for her summer lawn service?
\$210

If the mowing season lasts for 14 weeks, how much will Brianna earn for each job each week?
\$15

If she had worked for two more weeks, how much would she have earned?
\$720

Brianna agreed to shovel snow from the driveways and sidewalks for the same three neighbors. They agreed to pay her the same rate. However, it only snowed seven times that winter. How much did she earn shoveling snow?
\$945

What was her total income for both jobs?
\$945

Directions: Multiply or divide.

$32 \times 45 = 1,440$ $73 \times 14 = 1,022$ $92 \times 30 = 2,760$

$\begin{array}{r} 623 \\ 127 \overline{) 7476} \end{array}$	$\begin{array}{r} 940 \\ 23 \overline{) 21,620} \end{array}$	$\begin{array}{r} 815 \\ 40 \overline{) 32,600} \end{array}$
---	--	--

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38 Adding and Subtracting Like Fractions

A **fraction** is a number that names part of a whole. Examples of fractions are $\frac{1}{2}$ and $\frac{1}{4}$. **Like fractions** have the same denominator, or bottom number. Examples of like fractions are $\frac{1}{4}$ and $\frac{3}{4}$.

To add or subtract fractions, the denominators must be the same. Add or subtract only the **numerators**, the numbers above the line in fractions.


Example:

numerators	$\frac{5}{8} + \frac{1}{8} = \frac{4}{8}$	$\frac{4}{8} - \frac{1}{8} = \frac{3}{8}$
denominators	$\frac{5}{8} + \frac{1}{8} = \frac{4}{8}$	$\frac{4}{8} - \frac{1}{8} = \frac{3}{8}$

Directions: Add or subtract these fractions.

$\frac{6}{12} + \frac{3}{12} = \frac{9}{12}$	$\frac{4}{9} + \frac{1}{9} = \frac{5}{9}$	$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$	$\frac{5}{11} + \frac{4}{11} = \frac{9}{11}$
$\frac{1}{5} - \frac{2}{5} = \frac{1}{5}$	$\frac{2}{6} - \frac{1}{6} = \frac{1}{6}$	$\frac{4}{4} - \frac{1}{4} = \frac{3}{4}$	$\frac{5}{10} + \frac{3}{10} = \frac{8}{10}$

Directions: Color the part of each pizza that the given fraction.



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Adding and Subtracting Unlike Fractions

39

Unlike fractions have different denominators. Examples of unlike fractions are $\frac{1}{3}$ and $\frac{1}{4}$.

To add or subtract fractions, the denominators must be the same.

Example:

Step 1: Make the denominators the same by finding the least common denominator. The LCD of a pair of fractions is the same as the least common multiple (LCM) of their denominators.

Multiples of 3 are 3, 6, 9, 12, 15.
Multiples of 4 are 4, 8, 12, 16.
LCM (and LCD) = 12

$\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$

Step 2: Multiply by a number that will give the LCD. The numerator and denominator must be multiplied by the same number.

$\frac{1}{3} \times \frac{4}{4} = \frac{4}{12}$ $\frac{1}{4} \times \frac{3}{3} = \frac{3}{12}$

Step 3: Add the fractions. $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$

Directions: Follow the above steps to add or subtract unlike fractions. Write the LCM.

$\frac{2}{4} + \frac{3}{8} = \frac{7}{8}$	$\frac{3}{6} + \frac{1}{3} = \frac{5}{6}$	$\frac{4}{8} - \frac{1}{4} = \frac{11}{20}$
LCM = 8	LCM = 6	LCM = 20

The basketball team ordered two pizzas. They left $\frac{1}{4}$ of one and $\frac{1}{4}$ of the other. How much pizza was left?

$\frac{7}{12}$

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39

Reducing Fractions

40

A fraction is in lowest terms when the GCF of both the numerator and denominator is 1. These fractions are in lowest possible terms: $\frac{1}{3}$, $\frac{2}{3}$, and $\frac{3}{10}$.

Example: Write $\frac{4}{8}$ in lowest terms.

Step 1: Write the factors of 4 and 8.

Factors of 4 are 4, 2, 1.
Factors of 8 are 1, 8, 2, 4.

Step 2: Find the GCF: 4.

Step 3: Divide both the numerator and denominator by 4.

$\frac{4}{8} \div \frac{4}{4} = \frac{1}{2}$

Directions: Write each fraction in lowest terms.

$\frac{9}{12} = \frac{3}{4}$ lowest terms

factors of 9: 1, 3, 9
factors of 12: 1, 2, 3, 4, 6, 12 3, GCF

$\frac{2}{6} = \frac{1}{3}$	$\frac{10}{15} = \frac{2}{3}$	$\frac{8}{32} = \frac{1}{4}$	$\frac{4}{10} = \frac{2}{5}$
$\frac{12}{18} = \frac{2}{3}$	$\frac{6}{8} = \frac{3}{4}$	$\frac{14}{21} = \frac{2}{3}$	$\frac{3}{4} = \frac{3}{4}$

Directions: Color the pizzas to show that $\frac{2}{3}$ in lowest terms is $\frac{2}{3}$.

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Adding and Subtracting Unlike Fractions

41

Directions: Find the LCD, then add or subtract. Reduce your answer to lowest terms by dividing both the numerator and denominator by the GCF.

$\frac{1}{3} - \frac{2}{6} = \frac{1}{6}$ $\frac{5}{12} + \frac{1}{4} = \frac{8}{12}$ $\frac{3}{8} + \frac{1}{2} = \frac{7}{8}$

LCD = 9 LCD = 12 LCD = 8

GCF = 3 GCF = 4 GCF = 2

lowest terms 1/9 lowest terms 2/3 lowest terms 7/8

$\frac{8}{12} - \frac{1}{3} = \frac{4}{12}$ $\frac{8}{15} - \frac{1}{5} = \frac{5}{15}$ $\frac{4}{7} - \frac{4}{14} = \frac{4}{14}$

LCD = 12 LCD = 15 LCD = 14

GCF = 3 GCF = 5 GCF = 7

lowest terms 1/3 lowest terms 1/3 lowest terms 2/7

Joel and Jema competed in a bike race. After 30 minutes, Joel had finished $\frac{3}{4}$ of the race, and Jema had finished $\frac{2}{5}$ of the race. Who had finished more of the race?

Joel

How much more of the race had that person finished?

$\frac{1}{12}$

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Improper Fractions

42

An **improper fraction** has a numerator that is greater than its denominator. An example of an improper fraction is $\frac{5}{4}$. An improper fraction should be reduced to its lowest terms.

Example: $\frac{5}{4}$ is an improper fraction because its numerator is greater than its denominator.

Step 1: Divide the numerator by the denominator: $5 \div 4 = 1, r1$

Step 2: Write the remainder as a fraction: $\frac{1}{4}$

$\frac{5}{4} = 1\frac{1}{4}$ $1\frac{1}{4}$ is a mixed number—a whole number and a fraction.

Directions: Follow the steps above to change the improper fractions to mixed numbers.

$\frac{21}{5} = 4\frac{1}{5}$ $\frac{9}{4} = 2\frac{1}{4}$ $\frac{3}{2} = 1\frac{1}{2}$ $\frac{9}{6} = 1\frac{1}{2}$ $\frac{25}{4} = 6\frac{1}{4}$

Sara had 29 duplicate stamps in her stamp collection. She decided to give them to four of her friends. If she gave each of them the same number of stamps, how many duplicates will she have left?

29 \div 4 = 7 R1

Name the improper fraction in this problem: $\frac{29}{4}$

What step must you do next to solve the problem? change to a mixed number

Write your answer as a mixed number: $7\frac{1}{4}$

How many stamps could she give each of her friends? 7

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Mixed Numbers

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A **mixed number** is a whole number and a fraction together. An example of a mixed number is 2 $\frac{1}{4}$. A mixed number can be changed to an improper fraction.

Example: 2 $\frac{3}{4}$

Step 1: Multiply the denominator by the whole number: $4 \times 2 = 8$

Step 2: Add the numerator: $8 + 3 = 11$

Step 3: Write the sum over the denominator: $\frac{11}{4}$

Directions: Follow the steps above to change the mixed numbers to improper fractions.

$3\frac{2}{3} = \frac{11}{3}$	$6\frac{1}{5} = \frac{31}{5}$	$4\frac{7}{8} = \frac{39}{8}$	$2\frac{1}{2} = \frac{5}{2}$
$1\frac{4}{5} = \frac{9}{5}$	$5\frac{3}{4} = \frac{23}{4}$	$7\frac{1}{8} = \frac{57}{8}$	$9\frac{1}{6} = \frac{82}{6}$
$12\frac{1}{5} = \frac{61}{5}$	$25\frac{1}{2} = \frac{51}{2}$	$10\frac{2}{3} = \frac{32}{3}$	$14\frac{3}{8} = \frac{115}{8}$

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Improper Fractions and Mixed Numbers

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Directions: Write the mixed number for each fraction. Reduce to lowest terms.

$\frac{25}{6} = 4\frac{1}{6}$ $\frac{14}{5} = 2\frac{4}{5}$ $\frac{32}{9} = 3\frac{5}{9}$ $\frac{68}{38} = 2\frac{2}{3}$

$\frac{71}{8} = 8\frac{7}{8}$ $\frac{59}{5} = 10\frac{4}{5}$ $\frac{46}{6} = 7\frac{1}{3}$ $\frac{17}{4} = 4\frac{1}{4}$

$\frac{47}{6} = 7\frac{5}{6}$ $\frac{11}{2} = 5\frac{1}{2}$ $\frac{63}{8} = 7\frac{7}{8}$ $\frac{29}{4} = 7\frac{1}{4}$

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Adding Mixed Numbers

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To add mixed numbers, first find the least common denominator. Always reduce the answer to lowest terms.

Example: $5\frac{1}{4} \rightarrow 5\frac{3}{12}$
 $+ 6\frac{1}{3} \rightarrow + 6\frac{4}{12}$
 $\hline 11\frac{7}{12}$

Directions: Add. Reduce the answers to lowest terms.

$8\frac{1}{2}$	$5\frac{1}{4}$	$9\frac{3}{10}$	$8\frac{1}{5}$
$+ 7\frac{1}{4}$	$+ 2\frac{3}{8}$	$+ 7\frac{1}{5}$	$+ 6\frac{7}{10}$
$\hline 15\frac{3}{4}$	$\hline 7\frac{5}{8}$	$\hline 16\frac{1}{2}$	$\hline 14\frac{9}{10}$

$4\frac{4}{5}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{1}{12}$
$+ 3\frac{3}{10}$	$+ 7\frac{1}{4}$	$+ 1\frac{1}{3}$	$+ 3\frac{3}{4}$
$\hline 8\frac{1}{10}$	$\hline 10\frac{3}{4}$	$\hline 5\frac{5}{6}$	$\hline 9\frac{5}{6}$

The boys picked $3\frac{1}{2}$ baskets of apples. The girls picked $5\frac{1}{2}$ baskets. How many baskets of apples did the boys and girls pick in all? 9 baskets

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Review

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Directions: Match.

$\frac{1}{4} + \frac{1}{3}$	$\frac{19}{8}$
$\frac{1}{5} - \frac{1}{6}$	$\frac{7}{5}$
$1\frac{1}{5}$	$\frac{1}{30}$
$1\frac{2}{5}$	$\frac{7}{12}$
$2\frac{3}{8}$	$\frac{7}{6}$

Directions: Change the improper fractions to mixed numbers.

$\frac{12}{4} = 3$ $\frac{17}{5} = 3\frac{2}{5}$ $\frac{13}{3} = 4\frac{1}{3}$ $\frac{26}{3} = 8\frac{2}{3}$ $\frac{18}{7} = 2\frac{4}{7}$

Directions: Change the mixed numbers to improper fractions.

$5\frac{2}{5} = \frac{28}{5}$ $7\frac{1}{3} = \frac{22}{3}$ $6\frac{3}{10} = \frac{63}{10}$ $8\frac{3}{8} = \frac{69}{8}$ $\frac{87}{7} = 12\frac{3}{7}$

Directions: Reduce these fractions to lowest terms.

$\frac{4}{12} = \frac{1}{3}$ $\frac{3}{6} = \frac{1}{2}$ $\frac{6}{8} = \frac{3}{4}$ $\frac{5}{10} = \frac{1}{2}$ $\frac{3}{15} = \frac{1}{5}$

Directions: Add or subtract.

$1\frac{1}{4}$	$5\frac{1}{5}$	$6\frac{1}{12}$	$12\frac{2}{3}$	$9\frac{1}{2}$
$+ 2\frac{2}{3}$	$- 2\frac{1}{4}$	$+ 5\frac{3}{4}$	$- 9\frac{1}{12}$	$+ 8\frac{3}{5}$
$\hline 3\frac{4}{4}$	$\hline 3\frac{20}{20}$	$\hline 11\frac{5}{6}$	$\hline 3\frac{7}{12}$	$\hline 17\frac{5}{6}$

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Ordering Fractions

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When putting fractions in order from smallest to largest or largest to smallest, it helps to find a common denominator first.

Example: $\frac{1}{3}, \frac{1}{2}$ changed to $\frac{2}{6}, \frac{3}{6}$

Directions: Put the following fractions in order from least to largest value.

$\frac{1}{2}$	$\frac{2}{7}$	$\frac{4}{5}$	$\frac{1}{3}$	Least	$\frac{1}{3}$	$\frac{1}{2}$	Largest
$\frac{3}{12}$	$\frac{3}{6}$	$\frac{1}{3}$	$\frac{3}{4}$	$\frac{2}{12}$	$\frac{1}{3}$	$\frac{3}{6}$	$\frac{3}{4}$
$\frac{2}{5}$	$\frac{4}{15}$	$\frac{1}{3}$	$\frac{5}{15}$	$\frac{4}{15}$	$\frac{2}{5}$	$\frac{2}{5}$	$\frac{3}{5}$
$3\frac{4}{5}$	$3\frac{2}{5}$	$\frac{1}{5}$	$3\frac{1}{5}$	$\frac{9}{5}$	$3\frac{1}{5}$	$3\frac{2}{5}$	$3\frac{4}{5}$
$9\frac{1}{3}$	$9\frac{2}{3}$	$9\frac{1}{12}$	$8\frac{2}{3}$	$\frac{8}{3}$	$\frac{9}{3}$	$\frac{9}{3}$	$9\frac{1}{12}$
$5\frac{8}{12}$	$5\frac{5}{12}$	$5\frac{4}{24}$	$5\frac{3}{6}$	$\frac{5}{24}$	$\frac{5}{12}$	$5\frac{3}{6}$	$5\frac{8}{12}$

Four dogs were selected as finalists at a dog show. They were judged in four separate categories. One received a perfect score in each area. The dog with a score closest to four is the winner. Their scores are listed below. Which dog won the contest? Dog A

Dog A: $3\frac{4}{5}$ Dog B: $3\frac{2}{3}$ Dog C: $3\frac{5}{15}$ Dog D: $3\frac{9}{12}$

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Subtracting Mixed Numbers

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To subtract mixed numbers, first find the least common denominator. Reduce the answer to its lowest terms.

Directions: Subtract. Reduce to lowest terms.

Example: $6\frac{3}{10} \rightarrow 6\frac{10}{16}$
 $- 3\frac{4}{16} \rightarrow - 3\frac{4}{16}$
 $\hline 3\frac{6}{16} = 3\frac{3}{8}$

$2\frac{3}{7}$	$7\frac{2}{3}$	$6\frac{3}{4}$	$9\frac{5}{12}$
$- 1\frac{1}{14}$	$- 5\frac{1}{2}$	$- 2\frac{3}{12}$	$- 5\frac{3}{24}$
$\hline 1\frac{5}{14}$	$\hline 2\frac{13}{24}$	$\hline 4\frac{1}{2}$	$\hline 4\frac{1}{24}$

$5\frac{1}{2}$	$7\frac{3}{8}$	$8\frac{3}{8}$	$11\frac{5}{6}$
$- 3\frac{1}{3}$	$- 5\frac{1}{2}$	$- 6\frac{3}{8}$	$- 7\frac{1}{12}$
$\hline 2\frac{1}{6}$	$\hline 2\frac{5}{24}$	$\hline 1\frac{23}{24}$	$\hline 4\frac{3}{4}$

The Rodriguez Farm has $9\frac{1}{4}$ acres of corn. The Johnson Farm has $7\frac{1}{2}$ acres of corn. How many more acres of corn does the Rodriguez Farm have? $2\frac{1}{6}$ acres

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Comparing Fractions

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Directions: Use the symbol > (greater than), < (less than), or = (equal to) to show the relationship between each pair of fractions.

$\frac{1}{2} > \frac{1}{3}$ $\frac{2}{5} < \frac{3}{7}$ $\frac{3}{8} < \frac{1}{2}$

$\frac{3}{4} = \frac{6}{8}$ $\frac{2}{5} < \frac{4}{9}$ $\frac{3}{4} = \frac{1}{4}$

$\frac{3}{12} = \frac{1}{4}$ $\frac{2}{14} = \frac{1}{7}$ $\frac{5}{15} < \frac{2}{3}$

If Kelly gave $\frac{1}{4}$ of a pizza to Holly and $\frac{1}{5}$ to Diane, how much did she have left? $\frac{7}{15}$

Holly decided to share $\frac{1}{4}$ of her share of the pizza with Deb. How much did each of them actually get? $\frac{1}{6}$

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Multiplying Fractions

50

To multiply fractions, follow these steps:

$\frac{1}{2} \times \frac{3}{4} =$ **Step 1:** Multiply the numerators. $1 \times 3 = 3$
Step 2: Multiply the denominators. $2 \times 4 = 8$

When multiplying a fraction by a whole number, first change the whole number to a fraction.

Example: $\frac{1}{2} \times 8 = \frac{1}{2} \times \frac{8}{1} = \frac{8}{2} = 4$ reduced to lowest terms

Directions: Multiply. Reduce your answers to lowest terms.

$\frac{1}{2} \times \frac{5}{6} =$	$\frac{3}{5} \times \frac{1}{2} =$	$\frac{3}{8} \times 4 =$	$\frac{3}{8} \times \frac{1}{16} =$
$\frac{5}{16}$	$\frac{1}{3}$	$3\frac{1}{2}$	$\frac{3}{128}$
$\frac{7}{11} \times \frac{1}{3} =$	$\frac{2}{3} \times \frac{9}{4} =$	$\frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} =$	$\frac{1}{8} \times \frac{1}{4} \times \frac{1}{2} =$
$\frac{7}{33}$	$\frac{1}{2}$	$\frac{1}{27}$	$\frac{1}{64}$

Jennifer has 10 pets. Two-fifths of the pets are cats, $\frac{1}{4}$ are fish, and $\frac{1}{5}$ are dogs. How many of each pet does she have? Cats = 4
Fish = 5
Dogs = 1

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Multiplying Mixed Numbers

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Multiply mixed numbers by first changing them to improper fractions. Always reduce your answers to lowest terms.

Example:
 $2\frac{1}{3} \times 1\frac{1}{8} = \frac{7}{3} \times \frac{9}{8} = \frac{63}{24} = 2\frac{15}{24} = 2\frac{5}{8}$

Directions: Multiply. Reduce to lowest terms.


$1\frac{1}{2} \times 4\frac{1}{2} =$ $8\frac{5}{4}$	$2\frac{3}{4} \times 2\frac{3}{8} =$ $7\frac{3}{20}$	$4\frac{2}{3} \times 3\frac{1}{7} =$ $14\frac{2}{3}$
$6\frac{2}{5} \times 2\frac{1}{8} =$ $13\frac{3}{5}$	$3\frac{1}{2} \times 4\frac{5}{8} =$ $14\frac{15}{8}$	$7\frac{3}{8} \times 2\frac{1}{4} =$ $15\frac{41}{72}$

Sunnyvale Farm has two barns with 25 stalls in each barn. Cows use $\frac{1}{2}$ of the stalls, and horses use the rest.

How many stalls are for cows?
30 stalls

How many are for horses?
20 stalls

(Hint: First, find how many total stalls are in the two barns.)



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Dividing Fractions

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To divide fractions, follow these steps:

$\frac{3}{4} \div \frac{1}{4} =$

Step 1: "Invert" the divisor. That means to turn it upside down.

$\frac{3}{4} \div \frac{1}{4} =$

Step 2: Multiply the two fractions:

$\frac{3}{4} \times \frac{4}{1} = \frac{12}{4}$


Step 3: Reduce the fraction to lowest terms by dividing the denominator into the numerator.

$12 \div 4 = 3$

$\frac{3}{4} \div \frac{1}{4} = 3$

Directions: Follow the above steps to divide fractions.

$\frac{2}{3} \div \frac{1}{9} =$ $1\frac{1}{3}$	$\frac{1}{3} \div \frac{1}{12} =$ 4	$\frac{2}{3} \div \frac{1}{6} =$ $2\frac{1}{3}$
$\frac{12}{15} \div \frac{1}{6} =$ $1\frac{1}{4}$	$\frac{4}{5} \div \frac{1}{6} =$ $4\frac{1}{2}$	$\frac{2}{3} \div \frac{1}{3} =$ $\frac{1}{3}$
$\frac{1}{2} \div \frac{1}{4} =$ $1\frac{1}{2}$	$\frac{3}{4} \div \frac{1}{8} =$ 1	$\frac{1}{2} \div \frac{1}{6} =$ $\frac{3}{6}$



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Dividing Whole Numbers by Fractions

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Follow these steps to divide a whole number by a fraction:

$8 \div \frac{1}{4} =$

Step 1: Write the whole number as a fraction:

$\frac{8}{1} \div \frac{1}{4} =$

Step 2: Invert the divisor.

$\frac{8}{1} \div \frac{1}{4} =$

Step 3: Multiply the two fractions:


$\frac{8}{1} \times \frac{4}{1} = \frac{32}{1}$

Step 4: Reduce the fraction to lowest terms by dividing the denominator into the numerator. $32 \div 1 = 32$

Directions: Follow the above steps to divide a whole number by a fraction.

$6 \div \frac{1}{3} =$ 18	$4 \div \frac{1}{2} =$ 8	$21 \div \frac{1}{3} =$ 63
$9 \div \frac{1}{5} =$ 45	$4 \div \frac{1}{4} =$ 36	$12 \div \frac{1}{6} =$ 72

$\frac{1}{6}$ of a bag of popcorn fits into one bowl. How many bowls do you need if you have six bags of popcorn?
8 bowls



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Division Word Problems

54

Directions: Divide.

Simon has 3,000 small building blocks. He decided to share them with his cousin, Tina. He gave Tina $\frac{1}{5}$ of the blocks. How many blocks did he keep?
1,500 blocks



I'm has a collection of toy cars. His mother asked him to give $\frac{1}{3}$ of them to his sister, Tom. He gave Tom 120 cars. How many did he keep for himself?
270 cars

How many did he have before giving some of them away?
405 cars

Decky ordered two extra large pizzas for her four children. Each of the pizzas had been cut into 16 slices. If the children have equal servings, what fraction of the pizza will each child get?
 $\frac{1}{2}$ of a pizza

How many slices of pizza would that equal?
8 slices

It normally takes just one hour to mow the yard. Today, he only completed $\frac{1}{4}$ of the job. How long did he work?
48 minutes

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Decimals

55

A decimal is a number with one or more places to the right of a decimal point.

Examples: 6.5 and 2.25

Fractions with denominators of 10 or 100 can be written as decimals.

Examples:

$\frac{7}{10} = 0.7$ $\frac{0}{100} = 0.00$ $\frac{7}{100} = 0.07$

ones tenths hundredths


$\frac{15}{100} = 0.15$ $\frac{1}{100} = 0.01$ $\frac{5}{100} = 0.05$ $\frac{2}{100} = 0.02$

ones tenths hundredths

Directions: Write the fractions as decimals.

$\frac{1}{10} =$ 0.1	$\frac{5}{10} =$ 0.5	$\frac{1}{100} =$ 0.01	$\frac{1}{1000} =$ 0.001
$\frac{2}{10} =$ 0.2	$\frac{4}{10} =$ 0.4	$\frac{1}{1000} =$ 0.001	$\frac{1}{10000} =$ 0.0001
$\frac{3}{10} =$ 0.3	$\frac{7}{10} =$ 0.7	$\frac{1}{10000} =$ 0.0001	$\frac{1}{100000} =$ 0.00001
$\frac{6}{10} =$ 0.6	$\frac{9}{10} =$ 0.9	$\frac{1}{100000} =$ 0.00001	$\frac{1}{1000000} =$ 0.000001

$\frac{63}{100} =$ 0.63	$2\frac{8}{10} =$ 2.8	$38\frac{3}{100} =$ 38.04	$6\frac{13}{100} =$ 6.13
$5\frac{2}{100} =$ 5.02	$\frac{15}{100} =$ 0.16	$15\frac{1}{2} =$ 15.6	$\frac{3}{100} =$ 0.03



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Decimals and Fractions

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Directions: Write the letter of the fraction that is equal to the decimal.

0.25 = **G**

0.5 = **L**

0.37 = **J**

0.2 = **K**

0.65 = **C**

0.75 = **B**

0.6 = **D**

0.12 = **E**

0.33 = **A**

0.95 = **F**

0.3 = **I**

0.4 = **H**

A. $\frac{33}{100}$

B. $\frac{3}{4}$

C. $\frac{13}{20}$

D. $\frac{3}{5}$

E. $\frac{3}{25}$

F. $\frac{19}{20}$

G. $\frac{1}{4}$

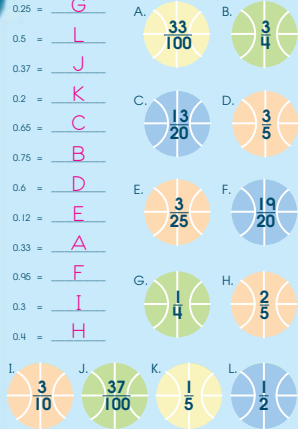
H. $\frac{2}{5}$

I. $\frac{3}{10}$

J. $\frac{37}{100}$

K. $\frac{1}{5}$

L. $\frac{1}{2}$



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57 Adding and Subtracting Decimals

A decimal is another way of writing a fraction. Decimals and fractions are numbers less than one.

Directions: Add or subtract. Remember to keep the decimal point in the proper place.

$\begin{array}{r} 0.5 \\ + 0.8 \\ \hline 1.3 \end{array}$	$\begin{array}{r} 0.35 \\ + 0.25 \\ \hline 0.60 \end{array}$	$\begin{array}{r} 47.5 \\ - 32.7 \\ \hline 14.8 \end{array}$	$\begin{array}{r} 85.7 \\ - 9.8 \\ \hline 75.9 \end{array}$
$\begin{array}{r} 13.90 \\ + 4.23 \\ \hline 18.13 \end{array}$	$\begin{array}{r} 9.53 \\ - 8.16 \\ \hline 1.37 \end{array}$	$\begin{array}{r} 72.8 \\ - 63.9 \\ \hline 8.9 \end{array}$	$\begin{array}{r} 6.43 \\ + 4.58 \\ \hline 11.01 \end{array}$
$\begin{array}{r} 638.07 \\ - 14.34 \\ \hline 618.73 \end{array}$	$\begin{array}{r} 811.060 \\ + 78.430 \\ \hline 889.490 \end{array}$	$\begin{array}{r} 521.09 \\ - 148.75 \\ \hline 372.34 \end{array}$	

Sean ran a 1-mile race in 5.58 minutes. Carlos ran it in 6.38 minutes. How much faster did Sean run?
0.8 minutes




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58 Multiplying Decimals

Multiply with decimals the same way you do with whole numbers. The decimal point moves in multiplication. Count the number of decimals in the problem and use the same number of decimals in your answer.


Example:

$\begin{array}{r} 3.5 \\ \times 1.5 \\ \hline 17.5 \\ 3.5 \\ \hline 5.25 \end{array}$	
---	---

Directions: Multiply.

$\begin{array}{r} 2.5 \\ \times 0.9 \\ \hline 2.25 \end{array}$	$\begin{array}{r} 67.4 \\ \times 2.3 \\ \hline 155.02 \end{array}$	$\begin{array}{r} 83.7 \\ \times 9.8 \\ \hline 820.26 \end{array}$
$\begin{array}{r} 9.06 \\ \times 2.38 \\ \hline 21.5628 \end{array}$	$\begin{array}{r} 28.97 \\ \times 5.16 \\ \hline 149.4852 \end{array}$	$\begin{array}{r} 33.41 \\ \times 9.93 \\ \hline 31.0713 \end{array}$

The jet flies 1.5 times faster than the plane with a propeller. The propeller plane flies 162.7 miles per hour. How fast does the jet fly?
244.05 mph



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59 Dividing With Decimals

When the dividend has a decimal, place the decimal point for the answer directly above the decimal point in the dividend. The first one is done for you.

$\begin{array}{r} 17.5 \\ 3 \overline{) 52.5} \\ \underline{-30} \\ 22.5 \\ \underline{-21} \\ 1.5 \\ \underline{-1.5} \\ 0 \end{array}$	$\begin{array}{r} 8.6 \\ 4 \overline{) 34.4} \\ \underline{-32} \\ 2.4 \\ \underline{-2.4} \\ 0 \end{array}$	$\begin{array}{r} 15.8 \\ 2 \overline{) 31.6} \\ \underline{-31} \\ 0.6 \\ \underline{-0.6} \\ 0 \end{array}$
$\begin{array}{r} 37.5 \\ 4 \overline{) 150} \\ \underline{-148} \\ 20 \\ \underline{-20} \\ 0 \end{array}$	$\begin{array}{r} 25.9 \\ 7 \overline{) 181.3} \\ \underline{-175} \\ 6.3 \\ \underline{-6.3} \\ 0 \end{array}$	$\begin{array}{r} 56.8 \\ 4 \overline{) 227.2} \\ \underline{-224} \\ 3.2 \\ \underline{-3.2} \\ 0 \end{array}$
$\begin{array}{r} 45.2 \\ 5 \overline{) 206} \\ \underline{-225} \\ 181 \\ \underline{-181} \\ 0 \end{array}$	$\begin{array}{r} 52.9 \\ 6 \overline{) 277.4} \\ \underline{-258} \\ 19.4 \\ \underline{-19.4} \\ 0 \end{array}$	$\begin{array}{r} 67.3 \\ 3 \overline{) 201.9} \\ \underline{-201} \\ 0.9 \\ \underline{-0.9} \\ 0 \end{array}$
$\begin{array}{r} 7.05 \\ 5 \overline{) 35.25} \\ \underline{-35} \\ 0.25 \\ \underline{-0.25} \\ 0 \end{array}$	$\begin{array}{r} 11.35 \\ 7 \overline{) 79.45} \\ \underline{-77} \\ 2.45 \\ \underline{-2.45} \\ 0 \end{array}$	$\begin{array}{r} 3.19 \\ 4 \overline{) 12.76} \\ \underline{-12} \\ 0.76 \\ \underline{-0.76} \\ 0 \end{array}$

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60 Dividing Decimals by Decimals

When the divisor has a decimal, you must eliminate it before dividing. You can do this by moving it to the right to create a whole number. You must also move the decimal the same number of spaces to the right in the dividend.

Sometimes, you need to add zeros to do this.

Example: $0.25 \overline{) 5.50}$ changes to $25 \overline{) 55.00}$

$\begin{array}{r} 93 \\ 0.5 \overline{) 46.5} \\ \underline{-45} \\ 1.5 \\ \underline{-1.5} \\ 0 \end{array}$	$\begin{array}{r} 71 \\ 0.4 \overline{) 28.4} \\ \underline{-28} \\ 0.4 \\ \underline{-0.4} \\ 0 \end{array}$	$\begin{array}{r} 91 \\ 0.4 \overline{) 36.8} \\ \underline{-36} \\ 0.8 \\ \underline{-0.8} \\ 0 \end{array}$
$\begin{array}{r} 58 \\ 0.4 \overline{) 23.2} \\ \underline{-23} \\ 0.2 \\ \underline{-0.2} \\ 0 \end{array}$	$\begin{array}{r} 81 \\ 0.7 \overline{) 56.7} \\ \underline{-56} \\ 0.7 \\ \underline{-0.7} \\ 0 \end{array}$	$\begin{array}{r} 9 \\ 1.2 \overline{) 10.8} \\ \underline{-10} \\ 0.8 \\ \underline{-0.8} \\ 0 \end{array}$
$\begin{array}{r} 450 \\ 1.3 \overline{) 585.0} \\ \underline{-540} \\ 45.0 \\ \underline{-45} \\ 0 \end{array}$	$\begin{array}{r} 120 \\ 4.7 \overline{) 564.0} \\ \underline{-476} \\ 88.0 \\ \underline{-88} \\ 0 \end{array}$	$\begin{array}{r} 98 \\ 8.4 \overline{) 820.8} \\ \underline{-840} \\ 80.8 \\ \underline{-80.8} \\ 0 \end{array}$
$\begin{array}{r} 325 \\ 8.4 \overline{) 2822.5} \\ \underline{-168} \\ 1142.5 \\ \underline{-1120} \\ 22.5 \\ \underline{-22.5} \\ 0 \end{array}$	$\begin{array}{r} 320 \\ 4.3 \overline{) 1376} \\ \underline{-86} \\ 516 \\ \underline{-436} \\ 80 \\ \underline{-80} \\ 0 \end{array}$	$\begin{array}{r} 318 \\ 2.4 \overline{) 622.2} \\ \underline{-48} \\ 142.2 \\ \underline{-144} \\ 0.2 \\ \underline{-0.2} \\ 0 \end{array}$

Master Skills Math Grade 5

60

61 Review

Directions: Multiply. Reduce to lowest terms.

$\frac{1}{4} \times \frac{1}{5} = \frac{1}{20}$	$\frac{5}{8} \times \frac{3}{10} = \frac{3}{16}$	$\frac{4}{6} \times \frac{1}{4} = \frac{1}{3}$
$5\frac{1}{4} \times 3\frac{1}{5} = 16\frac{4}{5}$	$3\frac{3}{4} \times 2\frac{1}{2} = 8\frac{1}{2}$	$4\frac{1}{6} \times 3\frac{0}{6} = 15$

Directions: Divide. Reduce to lowest terms.

$5 \div \frac{1}{5} = 25$	$18 \div \frac{1}{6} = 162$	$8 \div \frac{1}{4} = 4$
$18 \div \frac{1}{4} = 72$	$63 \div \frac{3}{8} = 100\frac{1}{3}$	$42 \div \frac{1}{5} = 210$

Directions: Write these fractions as decimals.

$\frac{7}{100} = 0.07$	$\frac{2}{5} = 0.4$	$37\frac{3}{10} = 37.3$
------------------------	---------------------	-------------------------

Directions: Add or subtract.

$\begin{array}{r} 14.5 \\ + 3.8 \\ \hline 18.3 \end{array}$	$\begin{array}{r} 26.43 \\ - 18.45 \\ \hline 8.48 \end{array}$	$\begin{array}{r} 137.092 \\ - 98.135 \\ \hline 38.957 \end{array}$
---	--	---

Directions: Multiply.

$\begin{array}{r} 83.3 \\ \times 0.6 \\ \hline 49.98 \end{array}$	$\begin{array}{r} 42.91 \\ \times 2.03 \\ \hline 87.1073 \end{array}$	$\begin{array}{r} 12.3 \\ \times 0.7 \\ \hline 8.61 \end{array}$
---	---	--

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61


62 Geometry


Geometry is the branch of mathematics that has to do with points, lines, and shapes.


Directions: Use the Glossary on pages 107 and 108 if you need help. Write the word from the box that is described below.


triangle	square	cube	angle
line	ray	segment	rectangle


a collection of points on a straight path that goes on and on in opposite directions
line 


a figure with three sides and three corners
triangle 


a figure with four equal sides and four corners
square 

part of a line that has one end point and goes on and on in one direction
ray 

part of a line having two end points
segment 

a space figure with six square faces
cube 

two rays with a common end point
angle 

a figure with four corners and four sides
rectangle 

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62

Geometry

63

Review the definitions on the previous page before completing the problems below.

Directions: Identify the labeled section of each of the following diagrams.

AB = segment

ABC = angle

AB = segment
CD = line

AC = ray

AB = segment

EBC = angle

BC = ray

Master Skills Math Grade 5

63

Similar, Congruent, and Symmetrical Figures

64

Similar figures have the same shape but have varying sizes.

Figures that are **congruent** have identical shapes but different orientations. That means they face in different directions.

Symmetrical figures can be divided equally into two identical parts.

Directions: Cross out the shape that does not belong in each group. Label the two remaining shapes as similar, congruent, or symmetrical.

congruent

similar

symmetrical

Master Skills Math Grade 5

64

Perimeter and Area

65

The **perimeter (P)** of a figure is the distance around it. To find the perimeter, add the lengths of the sides.

The **area (A)** of a figure is the number of units in a figure. Find the area by multiplying the length of a figure by its width.

Example:

P = 16 units
A = 16 units

P = 12 units
A = 6 units

Directions: Find the perimeter and area of each figure.

P = 16 units
A = 13 units

P = 12 units
A = 6 units

9 Yards
P = 36 yards
A = 81 sq. yards

45 Miles
2 Miles
P = 94 miles
A = 90 sq. miles

Master Skills Math Grade 5

65

Volume

66

The **volume** of a figure is the number of cubic units inside it.

Example: Volume = 6 cubic units

Directions: Draw figures to show the volumes given. Use the dot pattern to help you. The first one is done for you.

1 cubic unit

3 cubic units

5 cubic units

6 cubic units

7 cubic units

Master Skills Math Grade 5

66

Volume

67

The formula for finding the volume of a box is length times width times height ($L \times W \times H$). The answer is given in cubic units.

Directions: Solve the problems.

Example:

Height 8 ft.
Length 8 ft.
Width 8 ft.

$V = L \times W \times H = \text{volume}$
 $8 \times 8 \times 8 = 512 \text{ cubic ft. or } 512 \text{ ft.}^3$

4 ft.
12 ft.
6 ft.

$V = 288 \text{ ft.}^3$

6 ft.
1.5 ft.
2 ft.

$V = 18 \text{ ft.}^3$

7 ft.
4 ft.
3 ft.

$V = 189 \text{ ft.}^3$

2 ft.
2 ft.
2 ft.

$V = 8 \text{ ft.}^3$

3 ft.
6 ft.
20 ft.

$V = 360 \text{ ft.}^3$

5 ft.
15 ft.
22 ft.

$V = 1,650 \text{ ft.}^3$

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67

Perimeter and Area

68

Directions: Use the formulas for finding perimeter and area to solve these problems.

Julie's family moved to a new house. Her parents said she could have the largest bedroom. Julie knew she would need to find the perimeter of each room to find which one was largest.

One rectangular bedroom is 7 feet wide and 12 feet long. Another is 11 feet long and 9 feet wide. The third bedroom is a square. It is 9 feet wide and 9 feet long. Which one should she select to have the largest room?

the 11 x 9 room

The new home also has a swimming pool in the backyard. It is 32 feet long and 18 feet wide. What is the perimeter of the pool?

100 ft.

Julie's mother wants to plant flowers on each side of the new house. She will need three plants for every foot of space. The house is 75 feet across the front and back and 37.5 feet along each side. Find the perimeter of the house.

225 ft.

How many plants should she buy? 675 plants

The family decided to buy new carpeting for several rooms. Complete the necessary information to determine how much carpeting to buy.

Den: 12 ft. x 14 ft. = 168 sq. ft.
Master Bedroom: 20 ft. x 18 ft. = 360 sq. ft.
Family Room: 15 ft. x 25 ft. = 375 sq. ft.
Total square feet of carpeting: 903 sq. ft.

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68

Perimeter and Area

69

Directions: Find the perimeter and area.

- Length = 8 ft.
Width = 11 ft.
P = **38 ft.** A = **88 sq. ft.**
- Length = 12 ft.
Width = 10 ft.
P = **44 ft.** A = **120 sq. ft.**
- Length = 121 ft.
Width = 16 ft.
P = **274 ft.** A = **1,936 sq. ft.**

Directions: Find the perimeter, area, and volume.

- Length = 7 ft.
Width = 12 ft.
Height = 10 ft.
P = **38 ft.**
A = **84 sq. ft.**
V = **840 cu. ft.**
- Length = 12 in.
Width = 15 in.
Height = 20 in.
P = **54 in.**
A = **180 sq. in.**
V = **3,600 cu. in.**
- Length = 48 in.
Width = 7 ft.
Height = 12 in.
P = **22 ft.**
A = **28 sq. ft.**
V = **28 cu. ft.**
- Length = 22 ft.
Width = 40 ft.
Height = 10 ft.
P = **124 sq. ft.**
A = **880 sq. ft.**
V = **8,800 cu. ft.**

Master Skills Math Grade 5

69

Circumference

70

Circumference is the distance around a circle. The **diameter** is a line segment that passes through the center of a circle and has both end points on the circle.

To find the circumference of any circle, multiply 3.14 times the diameter. The number 3.14 represents π (pronounced pie) and is often written by the Greek symbol, π .

The formula for circumference is $C = \pi \times d$

C = circumference
d = diameter
 $\pi = 3.14$

Example:

Circle A
d = 2 in.
C = 3.14×2 in.
C = 6.28 in.

Directions: Find the circumference of each circle.

Circle B: d = 4 in. C = **12.56 in.**

Circle C: d = 6 in. C = **18.84 in.**

Circle D: d = 10 in. C = **31.4 in.**

Circle E: d = 14 in. C = **43.96 in.**

Circle F: d = 3 yd. C = **9.42 yd.**

Master Skills Math Grade 5

70

Circumference

71

The **radius** of a circle is the distance from the center of the circle to its outside edge. The diameter equals two times the radius.

Find the circumference by multiplying π (3.14) times the diameter or by multiplying π (3.14) times 2r (2 times the radius).

$C = \pi \times d$ or $C = \pi \times 2r$

Directions: Write the missing radius, diameter, or circumference.

Circle 1: radius 3, diameter 6, circumference **18.84**

Circle 2: radius 7, diameter 14, circumference **43.96**

Circle 3: radius 6, diameter 12, circumference **37.68**

Circle 4: radius 2, diameter 4, circumference **12.56**

Circle 5: radius 4, diameter 8, circumference **25.12**

Circle 6: radius 5, diameter 10, circumference **31.4**

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71

Diameter, Radius, and Circumference

72

Directions: Write the missing radius, diameter, or circumference.

Kalle was asked to draw a circle on the playground for a game during recess. If the radius of the circle needed to be 14 inches, how long is the diameter? **28 in.**

What is the circumference? **87.92 in.**

Jamie was creating an art project. He wanted part of it to be a sphere. He measured 24 inches for the diameter.

What would the radius of the sphere be? **12 in.**

Find the circumference. **75.36 in.**

Unfortunately, Jamie discovered that he didn't have enough material to create a sphere that large, so he cut the dimensions in half. What are the new dimensions for his sphere?

Radius **6 in.**

Diameter **12 in.**

Circumference **37.68 in.**

Master Skills Math Grade 5

72

Triangle Angles

73

A **triangle** is a figure with three corners and three sides. Every triangle contains three angles. The sum of the angles is always 180, regardless of the size or shape of the triangle.

If you know two of the angles, you can add them together, then subtract the total from 180 to find the number of degrees in the third angle.

Directions: Find the number of degrees in the third angle of each triangle.

Triangle 1: $\angle A = 45^\circ$, $\angle B = 60^\circ$, $\angle C =$ **75°**

Triangle 2: $\angle A = 65^\circ$, $\angle C = 25^\circ$, $\angle B =$ **60°**

Triangle 3: $\angle A = 60^\circ$, $\angle B = 30^\circ$, $\angle C =$ **90°**

Triangle 4: $\angle A = 80^\circ$, $\angle C = 80^\circ$, $\angle B =$ **20°**

Triangle 5: $\angle A = 120^\circ$, $\angle C = 15^\circ$, $\angle B =$ **45°**

Triangle 6: $\angle A = 15^\circ$, $\angle C = 10^\circ$, $\angle B =$ **155°**

Triangle 7: $\angle A = 115^\circ$, $\angle C = 85^\circ$, $\angle B =$ **50°**

Triangle 8: $\angle A = 70^\circ$, $\angle B = 20^\circ$, $\angle C =$ **90°**

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73

Area of a Triangle

74

The area of a triangle is found by multiplying $\frac{1}{2}$ times the base times the height.

$A = \frac{1}{2} \times b \times h$

Example:

4 in. is the height. 8 in. is the base. $A = \frac{1}{2} \times 4 \times 8 = \frac{32}{2} = 16$ sq. in.

Directions: Find the area of each triangle.

Triangle 1: height 4 in., base 2 in. A = **4 sq. in.**

Triangle 2: height 3 in., base 8 in. A = **12 sq. in.**

Triangle 3: height 9 in., base 4 in. A = **18 sq. in.**

Triangle 4: height 2.5 in., base 6 in. A = **7.5 sq. in.**

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74

75 Estimating Area

Estimating area means giving an approximate number of square units in a figure.

Example: The Andrews family is building a swimming pool. To find out how much material they will need, they must estimate the area of the pool.

Step 1: Count the number of whole squares: 14

Step 2: Count the number of partial squares: 12

Step 3: Divide the number of partial squares by 2: 6

Step 4: Add $\frac{1}{2}$ the number of the partial squares to the number of whole squares. Round to the nearest whole number.
 $14 + 6 = 20$

Directions: Follow the steps to estimate the area of each figure. Round the answer to the nearest whole number.

whole units 21
partial units 4
 $A = 23$ sq. units

whole units 17
partial units 4
 $A = 19$ sq. units

Answers may vary slightly.

whole units $5\frac{1}{2}$
partial units $\frac{1}{2}$
 $A = 7$ sq. units

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75

46 Subtracting Mixed Numbers

To subtract mixed numbers, first find the least common denominator. Reduce the answer to its lowest terms.

Directions: Subtract. Reduce to lowest terms.

Example: $6\frac{6}{12} - 3\frac{3}{12} = 3\frac{3}{12} = 3\frac{1}{4}$

$2\frac{1}{2} - 1\frac{1}{4} = 1\frac{2}{4} - 1\frac{1}{4} = \frac{1}{4}$

$7\frac{3}{4} - 5\frac{1}{4} = 2\frac{2}{4} = 2\frac{1}{2}$

$6\frac{1}{2} - 2\frac{1}{2} = 4$

$9\frac{3}{4} - 5\frac{3}{4} = 4$

$5\frac{1}{2} - 3\frac{1}{2} = 2$

$7\frac{3}{4} - 5\frac{1}{4} = 2\frac{2}{4} = 2\frac{1}{2}$

$8\frac{1}{2} - 6\frac{1}{2} = 2$

$11\frac{3}{4} - 7\frac{3}{4} = 4$

$2\frac{1}{6} - 2\frac{5}{24} = 1\frac{4}{24} = 1\frac{1}{6}$

$4\frac{1}{4} - 4\frac{3}{4} = 3\frac{4}{4} - 4\frac{3}{4} = 3\frac{1}{4} - 4\frac{3}{4} = 2\frac{4}{4} - 3\frac{3}{4} = 1\frac{1}{4}$

The Rodriguez farm has $9\frac{1}{2}$ acres of corn. The Johnson farm has $7\frac{1}{4}$ acres of corn. How many more acres of corn does the Rodriguez farm have? $2\frac{1}{4}$ acres

Master Skills Math Grade 5

76

77 Review

Directions: Find the perimeter and area of each figure.

$P = 36$ in., $A = 80$ sq. in.

$P = 24$ in., $A = 36$ sq. in.

Directions: Find the circumference of each circle.

$D = 3$ in., $C = 9.42$ in.

$D = 5$ ft., $C = 15.7$ in.

$D = 6$ yd., $C = 18.84$ yd.

Directions: Find the area of each triangle.

$A = 40$ sq. in.

$A = 35$ sq. in.

Directions: Draw a line from the space figure to its name.

cone, pyramid, cylinder, cube

Master Skills Math Grade 5

77

78 Measurement

Directions: Use the map to help plan a day at the zoo.

City Zoo

KEY:
 A ENTRANCE
 B REPTILES
 C ELEPHANTS
 D SEALS
 E LIONS
 F MONKEYS
 G BIRDS
 H FOOD CENTER

A logical path to travel from A to H to see the animals?
 $A \rightarrow F \rightarrow C \rightarrow G \rightarrow H$

What path would you take to see the seals, reptiles, and monkeys before leaving the zoo?
 $H \rightarrow B \rightarrow A \rightarrow F \rightarrow D \rightarrow A$

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78

79 Measurement

Directions: Use the map on the previous page to answer these questions.

What is the shortest path to follow from the front gate in order to see the elephants, monkeys, and birds?
 $A \rightarrow F \rightarrow G \rightarrow C$

Traveling from the food center, which animal arena is farthest away?
 seals

Which is closest?
 reptiles

Which animals would you see if you only traveled the path on the perimeter of the zoo?
 seals, elephants, reptiles

What shape would you create if you followed the path from A to D to F and back to A?
 triangle

Is it possible to create a square by following any of the paths? If so, which ones?
 no

Master Skills Math Grade 5

79

80 Length

Inches, feet, yards, and miles are used to measure length in the United States.

12 inches = 1 foot (ft.)
 3 feet = 1 yard (yd.)
 36 inches = 1 yard
 $1,760$ yards = 1 mile (mi.)

Directions: Circle the best unit to measure each object. The first one is done for you.

the length of a (inches) feet yards miles

the height of a inches (feet) yards miles

the length of a (inches) feet yards miles

distance to the inches feet yards (miles)

the length of a inches (feet) (yards) miles

Master Skills Math Grade 5

80

Length

81

Units of measure can be converted (changed) from one unit to another.

Example: The distance from the teacher's desk to the door is 24 feet.
24 ft. = 8 yd.

Directions: Convert the units of measure using the conversions on the previous page.

The distance from the plants to the computer is 5 yd.
5 yd. = 15 ft.

The teacher's desk is 5 ft. long.
5 ft. = 60 in.

The reading corner is 3 yd. wide.
3 yd. = 108 in.

The distance from the computer to the door is 9 yd.
9 yd. = 27 ft.

Classroom Map

Master Skills Math Grade 5

81

Length

82

Directions: Use a ruler to find the shortest paths. Round your measurement to the nearest quarter inch. Then, convert to yards using the scale.

Scale: 1 inch = 100 yards

Hot dog stand to the roller coaster 225 yds.

The Ferris wheel to the animal barn 250 yds.

Entrance to roller coaster 400 yds.

Ferris wheel to roller coaster to entrance 575 yds.

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82

Length: Metric

83

Millimeters, centimeters, meters, and kilometers are used to measure length in the metric system.

1 meter = 39.37 inches
1 kilometer = about $\frac{1}{2}$ mile
10 millimeters = 1 centimeter (cm)
100 centimeters = 1 meter (m)
1,000 meters = 1 kilometer (km)

Directions: Circle the best unit to measure each object. The first one is done for you.

the length of a centimeters meters kilometers

the height of a centimeters meters kilometers

the length of a centimeters meters kilometers

distance to the centimeters meters kilometers

the length of a centimeters meters kilometers

Master Skills Math Grade 5

83

Length: Metric

84

2.54 centimeters = 1 inch
1 millimeter = $\frac{1}{25}$ centimeter

Directions: Use a metric ruler to measure the length of each object.

2 $\frac{1}{4}$ cm.

10 $\frac{3}{4}$ cm.

7 $\frac{1}{4}$ cm.

5 $\frac{1}{2}$ cm.

12 $\frac{3}{4}$ cm.

3 cm.

Master Skills Math Grade 5

84

Weight

85

Ounces, pounds, and tons are used to measure weight in the United States.

16 ounces = 1 pound (lb.)
2,000 pounds = 1 ton (tn.)

Directions: Circle the most reasonable estimate for the weight of each object. The first one is done for you.

10 ounces 10 pounds 10 tons

6 ounces 6 pounds 6 tons

2 ounces 2 pounds 2 tons

3 ounces 3 pounds 3 tons

1,800 ounces 1,800 pounds 1,800 tons

1 ounce 1 pound 1 ton

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85

Weight: Metric

86

Grams and kilograms are units of weight in the metric system. A paper clip weighs about 1 gram. A kitten weighs about 1 kilogram.

1 kilogram (kg) = about 2.2 pounds
1,000 grams (g) = 1 kilogram

Directions: Circle the best unit to weigh each object.

kilogram gram

kilogram gram

kilogram gram

kilogram gram

kilogram gram

kilogram gram

kilogram gram

kilogram gram

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86

Capacity

87

The fluid ounce, cup, pint, quart, and gallon are used to measure capacity in the United States.

8 fluid ounces (fl. oz.) = 1 cup (c.)
 2 cups = 1 pint (pt.)
 2 pints = 1 quart (qt.)
 2 quarts = 1 half gallon ($\frac{1}{2}$ gal.)
 4 quarts = 1 gallon (gal.)

1 cup 1 pint 1 quart 1 half gallon 1 gallon

Directions: Convert the units of capacity.

13 gal. = 52 qt. 10 pt. = 20 c. 12 c. = 6 pt.
 4 gal. = 16 qt. 16 qt. = 4 gal. 5 c. = 2 $\frac{1}{2}$ pt.
 36 pt. = 4 $\frac{1}{2}$ gal. 12 qt. = 24 pt. 6 gal. = 48 pt.
 16 c. = 4 qt. 32 oz. = 4 c. 16 oz. = 1 pt.

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87

Capacity: Metric

88

Milliliters and liters are units of capacity in the metric system. A can of soda contains about 350 milliliters of liquid. A large plastic bottle contains 1 liter of liquid. A liter is about a quart.

1,000 milliliters (mL) = 1 liter (L)

Directions: Circle the best unit to measure each liquid.

Master Skills Math Grade 5

88

Comparing Measurements

89

Directions: Use the symbols greater than (>), less than (<), or equal to (=) to complete each statement.

10 inches > 10 centimeters
 40 feet < 120 yards
 25 grams < kilograms
 16 quarts = 4 gallons
 2 liters > 2 milliliters
 16 yards > 6 meters
 3 miles > 3 kilometers
 20 centimeters < 20 meters
 85 kilograms > 8 grams

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89

Temperature: Fahrenheit

90

Fahrenheit (°F) is a unit for measuring temperature.

Directions: Write the temperature in degrees Fahrenheit (°F). The first one is done for you.

Master Skills Math Grade 5

90

Temperature: Celsius

91

Celsius (°C) is a unit for measuring temperature in the metric system.

Directions: Write the temperature in degrees Celsius (°C). The first one is done for you.

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91

Review

92

Directions: Name three common objects that are measured in metric units. Draw a picture of the object and tell what metric unit of measure is used.

Example: Bleach — 3 liters

Answers will vary.

Master Skills Math Grade 5

92

Review 93

Directions: Write the best unit to measure each item: inch, foot, yard, mile, ounce, pound, ton, fluid ounce, cup, pint, quart, or gallon.

distance from New York to Chicago miles

weight of a goldfish ounces

height of a building feet

water in a large fish tank gallons

glass of milk fluid ounce

weight of a whale tons


length of a pencil inches

distance from first base to second base feet

distance traveled by a space shuttle miles

length of a soccer field yards

amount of paint needed to cover a house gallons



Master Skills Math Grade 5

Percent 95

Percent is a ratio meaning "per hundred." It is written with a % sign. 20% means 20 percent or 20 per hundred.

Example:

•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•

ratio = $\frac{30}{100}$
percent = 30%


•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•

ratio = $\frac{55}{100}$
percent = 55%

Directions: Write the percent for each ratio.

$\frac{7}{100} = 7\%$	$\frac{38}{100} = 38\%$
$\frac{63}{100} = 63\%$	$\frac{3}{100} = 3\%$
$\frac{40}{100} = 40\%$	$\frac{1}{5} = 20\%$

The school received 100 books for the Book Fair. It sold 43 books. What is the percent of books sold to books received? 43%



Master Skills Math Grade 5

Probability 97

Probability is the ratio of favorable outcomes to possible outcomes of an experiment.

Vehicle	Number Sold
4 door	26
2 door	18
Sport	7
Van	12
Wagon	7
Compact	5
Total	75

Example: This table records vehicle sales for 1 month. What is the probability of a person buying a van?
number of vans sold = 12 total number of cars = 75
The probability that a person will choose a van is $\frac{12}{75}$ or $\frac{4}{25}$.

Directions: Look at the chart of flowers sold in a month. What is the probability that a person will buy each?

Flowers	Number Sold
Roses	18
Tulips	10
Violets	11
Orchids	7
Total	76

Roses $\frac{18}{76}$ in $\frac{9}{38}$

Tulips $\frac{10}{76}$ in $\frac{5}{38}$

Violets $\frac{11}{76}$ in $\frac{11}{76}$

Orchids $\frac{7}{76}$ in $\frac{7}{76}$

How would probability help a flower store owner keep the correct quantity of each flower in the store?
Answers will vary.

Master Skills Math Grade 5

Ratio 94

A **ratio** is a comparison of two quantities.

Ratios can be written three ways: 2 to 3, 2 : 3, or $\frac{2}{3}$. Each ratio is read: two to three.

Example:
The ratio of triangles to circles is 2 to 3.
The ratio of circles to triangles is 3 to 2.

Directions: Write the ratio that compares these items.

ratio of tulips to cacti 2:3

ratio of cubes to triangles 2:2

ratio of pens to pencils 3:4

Master Skills Math Grade 5

Ratio and Percent 96

A ratio is used to show the relationship between two things. A percent is a way of stating a ratio as compared to 100.

Type of Animal	Animals of the Zoo	
	Total Number of Animals	Number of Adults
Reptiles	15	8
Elephants	6	4
Seals	12	8
Lions	7	6
Monkeys	45	30
Tropical Birds	15	12

Directions: Use the chart to find the ratios.

Seals to elephants $\frac{12}{6}$ or $\frac{2}{1}$

Adult monkeys to young monkeys $\frac{30}{15}$ or $\frac{2}{1}$

Lions to tropical birds $\frac{7}{15}$

Mammals to reptiles $\frac{70}{15}$ or $\frac{14}{3}$

Young reptiles to young mammals $\frac{7}{22}$

Total adults to total young $\frac{68}{32}$ or $\frac{17}{8}$

Directions: Use the chart to find the percents.

What percent of the zoo animals are adults? 68%

What percent of the animals have feathers? 15%

What percent of the animals reproduce by laying eggs? 30%

What percent of the animals are cold-blooded? 15%

Master Skills Math Grade 5

Calculators 98

A **calculator** is a machine that rapidly does addition, subtraction, multiplication, division, and other mathematical functions.

Example:
Carlos got 7 hits in 20 at bats.

$$\frac{7}{20} = \frac{35}{100} = 35\%$$

To use a calculator:
Step 1: Press 7.
Step 2: Press the \div symbol.
Step 3: Press 20.
Step 4: Press the = symbol.
Step 5: 0.35 appears.
Step 6: 0.35 = 35%.

Directions: Use a calculator to find the percent of hits to the number of at bats for each baseball player. Round your answer to two digits. If your calculator displays the answer 0.753, round it to 0.75 or 75%.

Player	Hits	At Bats	Percent
Carlos	7	20	35%
Troy	3	12	25%
Sasha	4	14	29%
Dan	8	18	44%
Jaye	5	16	31%
Keesha	9	17	53%
Martin	11	16	69%

Who is most likely to get a hit? Martin

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Finding Percents

99

Find percent by dividing the number you have by the number possible.

Example:
 15 out of 20 possible: $\frac{15}{20} = \frac{0.75}{1} = 75\%$
 $\frac{15}{20} = \frac{150}{200} = \frac{150}{200} = 75\%$

Directions: Annie has been keeping track of the scores she earned on each spelling test during the grading period. Find out each percentage grade she earned. The first one is done for you.

Week	Number Correct	Total Number of Words	Score in Percent
1	14 (out of)	20	70%
2	16	20	80%
3	18	20	90%
4	12	15	80%
5	16	16	100%
6	17	18	94%
Review Test	51	60	85%

If Susan scored 5% higher than Annie on the review test, how many words did she get right? **54**

Carrie scored 10% lower than Susan on the review test. How many words did she spell correctly? **48**

99

Locating Points on a Grid

100

Coordinates help locate places on maps at the point where their imaginary lines intersect.

Directions: Write the coordinates for the location of each object. The first one is done for you.

Doll	3, T	Cat	15, N
Dog	13, B	Bike	15, V
Skateboard	7, I	Bird	4, C
Jump Rope	21, R	Baseball Glove	17, K
Rabbit	19, C		

100

Locating Points on a Grid

101

To locate points on a grid, read the first coordinate and follow it to the second coordinate.

Example: 3, C

Directions: Maya is new in town. Help her learn the way around her new neighborhood. Place the following locations on the grid below.

Grocery	10, C
Home	2, B
School	12, A
Playground	13, B
Library	6, D
Bank	1, G
Post Office	7, E
Ice-Cream Shop	3, D

Is her home closer to the bank or the grocery? **bank**

Does she pass the playground on her way to school? **no**

If she needs to stop at the library after school, will she be closer to home or farther away? **closer**

101

Locating Points on a Grid

102

Directions: Draw the lines as directed from point to point for each graph.

Draw a line from:

- P (3, 7) to Q (1, 1)
- Q (1, 1) to R (6, 6)
- R (6, 6) to S (3, 3)
- S (3, 3) to T (1, 7)
- T (1, 7) to U (6, 1)
- U (6, 1) to V (1, 1)
- V (1, 1) to W (7, 7)
- W (7, 7) to X (1, 6)
- X (1, 6) to Y (6, 6)
- Y (6, 6) to Z (1, 6)

Draw a line from:

- J (1, 4) to K (4, 4)
- K (4, 4) to L (4, 1)
- L (4, 1) to M (1, 1)
- M (1, 1) to N (1, 4)
- N (1, 4) to O (4, 4)
- O (4, 4) to P (4, 1)
- P (4, 1) to Q (1, 1)
- Q (1, 1) to R (1, 4)
- R (1, 4) to S (4, 4)
- S (4, 4) to T (4, 1)
- T (4, 1) to U (1, 1)
- U (1, 1) to V (1, 4)
- V (1, 4) to W (4, 4)
- W (4, 4) to X (4, 1)
- X (4, 1) to Y (1, 1)
- Y (1, 1) to Z (1, 4)

102

Graphs

103

A graph is a drawing that shows information about changes in numbers.

Directions: Use the graph to answer the questions.

Line Graph **Temperatures for One Year**

Which month was the coldest? **Dec.**

Which month was the warmest? **July**

Which three months were 40 degrees? **Jan., March, Nov.**

Bar Graph

Home Runs

How many home runs did the Green team hit? **50**

How many more home runs did the Green team hit than the Red team and Blue team combined? **20**

103

Graphs

104

Directions: Read each graph and follow the directions.

List the names of the students from the shortest to the tallest.

- Tiffany**
- Michele**
- Andy**
- Louis**
- Jessie**
- Stephie**

List the months in the order of the most number of outside recesses to the least number.

- June**
- May**
- April**
- September**
- October**
- March**
- November**
- February**
- January**
- December**

104

Graphs **105**

Directions: Complete the graph using the information in the table.

Student	Books read in February
Sue	20
Joe	8
Peter	12
Cindy	16
Dean	15
Carol	8

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105

106 **Review**

Directions: Write a ratio for each.

Circles to cubes: **3:3** or **1:1**

Baseballs to bats: **2:1**

Directions: Write each ratio as a percent.

$\frac{73}{100} = 73\%$ $\frac{4}{100} = 4\%$ $\frac{1}{4} = 25\%$ $\frac{2}{5} = 40\%$

Directions: Complete the graph using the table.

Today's Temperature

City	°F
Phoenix	60°
New York	35°
Chicago	40°
Miami	60°

Master Skills Math Grade 5

106

Mathematics is a lifelong skill your child will never outgrow. Take advantage of opportunities to point out instances where math skills are applicable and necessary for daily tasks like balancing a checkbook, comparing costs, or estimating the total at the grocery store.

The Four Basic Math Functions

Addition, subtraction, multiplication, and division are the four basic math functions we use every day. Play oral counting games, counting by threes, fours, fives, sixes, sevens, etc. While tossing a ball back and forth, alternate turns counting by a given number. The person catching the ball says the next consecutive number in the sequence.

Count backwards by threes, fours, fives, etc., starting at different numbers each time.

Make up word problems with addition, subtraction, multiplication, and division with your child while traveling in the car, waiting at the doctor's office, or doing the dishes together. Use the situation to add relevance to the word problems. Include your child's name or friends' names in the problems.

Examples:

It is 375 miles to grandma's house. We have traveled 217 miles. How much farther do we need to drive?

It is 375 miles to grandma's house. We will take a break about half-way there. After how many miles will we take a break?

Family Math Challenge

Post a math question on the refrigerator. The first person to solve the question can select the next problem for the family. Plan a reward for the person who answers the most questions accurately during the week.

Math Maze

Plan a math maze by writing out math problems on large sheets of paper. On the back of each paper, write a clue telling where to find the next math page. Each math problem must be solved correctly before going on to the next one. Plan a small treat or reward at the end of the game.

Baking With Math

Baking and cooking are great opportunities for using math skills like measurement and fractions. Have your child help double or triple a recipe and calculate the ingredients needed.

Ask your child to create a chart showing grocery items labeled in metric and nonmetric units. Work together to change a recipe to metric measure.

Fractions

Let your child cut sandwiches into different fractions other than one-half or one-quarter.

Let your child cut a pizza into equal parts. Calculate the fraction of the pizza each member of the family can eat.

Percents

Help your child collect family data, like time spent sleeping, driving to work, etc. Ask him or her to create a graph showing time usage. Have him or her calculate the percent of a day or week spent doing various tasks.

Measurement

A tape measure is a great tool for measuring and a terrific learning tool. Let your child measure and compare the perimeter of various objects. Challenge him or her to find two unlike objects with exactly the same perimeter.

Money

Involve your child in opportunities dealing with money. Ask him or her to estimate prices on a shopping list, calculate change, or double check a bill at a restaurant and calculate the tip.

Have your child determine how he or she spends his or her money. When he or she receives a money gift or allowance, ask him or her to figure the percent spent on savings, gifts, and items purchased.

Help your child calculate the interest earned by putting aside a specific amount each week for a year. Help him or her work toward achieving a specific monetary goal.

When shopping, keep track of the number of items purchased and the total spent. Ask your child to determine the average cost.

Building

If you are planning to build a dog house, buy new carpeting, or build a fence, involve your child in the planning by letting him or her help measure and calculate expenses. Create a supply list together. Use ads for prices to calculate the total cost. Explore alternate ways to complete the project at a lower cost. Many daily projects from planting a garden to reroofing the house involve mathematics. With all those opportunities available, you can keep your child involved in math every day.